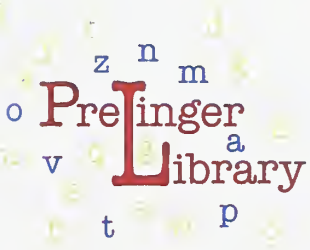
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AERO DIGEST



WILKINS' FLIGHT
across
POLAR REGIONS

"BREMEN"
flies from
Ireland to
America

Col. LINDBERGH'S
new
RYAN BROUGHAM

Now You can finish your own plane in BERRYLOID-DOPE COLORS



NO NEED to fly a drab-looking ship now—just brush on Berryloid Dope Colors yourself. The new product exactly fits the need of small airports, operators and private owners who have not the necessary equipment for spraying on Aircraft Berryloid.

Berryloid Dope Colors are available in 26 standard shades of Aircraft Berryloid and come in paste form ready for mixing with clear nitrate dope, ¾ of a pound to a gallon of dope. Pigments are finely ground in a secret-processed oil giving life and beauty to the resulting finish never before attained in pigmented dopes. These colors will not "skin over". Berryloid Dope Colors are also used by manufacturers as "ground coats" before applying lacquer finish of poor hiding colors.

PROGRESSIVE AIRCRAFT FINISHES

Berryloid Dope Colors and other Progressive Aircraft Finishes carried in stock by

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Berry Brothers, Inc.
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Gentlemen: Please send me material checked below.

- ☐ Berryloid Dope Colors folder
- ☐ Specifications for Aircraft Finishing
- ☐ Berry's Lionoil folder

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Varnishes Enamels and Lacquers
Detroit, Michigan *1858—70th Anniversary—1928* *Walkerville, Ont.*

Manufacturer of Progressive Aircraft Finishes

AERO DIGEST, *May*, 1928. *Published every month. Volume XII, Number 5. Publication office, 220 West 42nd Street, New York, N. Y. Subscription price $3.00 a year; single copies, 25 cents; foreign subscriptions, $4.00. Entered as second-class matter July 17, 1922, at the Post Office at New York, N. Y., under the Act of April 3, 1879. Copyrighted, 1928, by Aeronautical Digest Publishing Corporation.*

HOW MUCH MONEY...

DOES YOUR AIRPLANE EARN?

If you consider airplane operation in terms of dollars and cents . . . if you figure your costs in relation to your income . . . if you want to profit by your investment . . . you will soon discover that the possibilities and performance of a Fairchild All-Purpose Cabin Monoplane are more profitable than the average low-priced open-cockpit sort of 'plane.

HERE ARE THE FACTS

Comparison of the Operating Costs of a Fairchild Cabin Monoplane with the average low-priced airplane★

INITIAL INVESTMENT

Fairchild 4-passenger cabin monoplane complete with Whirlwind engine and starter	$12,980.00
Average low-priced 2-passenger open cockpit airplane with Ox engine	2,700.00

HOURLY OPERATING EXPENDITURES

	Whirlwind per hour	Ox per hour
1. Engine depreciation Whirlwind at $4,910 cost—1,500 hrs. life	$ 3.27	$ 1.00
2. Oil and Gasoline	5.00	3.00
3. Overhauls Whirlwind every 250 hrs. @ $250 cost	1.00	
Ox every 100 hrs. @ $200 cost		2.00
4. Pilots hourly rate of pay	5.00	5.00
Total Hourly Operating Expenditures	$14.27	$11.00

YEARLY OPERATING EXPENDITURES

	"Cabin 'plane" per year	"Cockpit 'plane" per year
5. Airplane depreciation—20% of airplane without engine	$ 1,614.00	$ 440.00
6. Pilot's base pay	2,600.00	2,600.00
7. Half-time of $60 per week mechanic's service	1,560.00	1,560.00
8. Annual overhaul	1,000.00	600.00
9. Insurance — fire, crash, etc., @ 20% value of complete 'plane	2,596.00	540.00
10. Allowance for crash losses exempted from coverage by "deductible" clause of insurance policy	600.00	500.00
11. Rent of hangar and use of field for "hopping"	1,500.00	1,500.00
Total Yearly Operating Expenditure	$11,470.00	$7,740.00

TOTAL OPERATING COSTS

	"Cabin 'plane" per hour	"Cockpit 'plane" per hour
12. Hourly expenditures	$14.27	$11.00
13. Yearly expenditures divided over 700 hrs. flying	16.39	11.06
Total Cost per Hour	$30.66	$22.06
14. Cruising speed in miles per hour	100 m.p.h.	70 m p.h.
15. Net pay load in pounds	1000 lbs.	410 lbs.
16. Total cubic feet of package space, including cabin, etc.	130 cu.ft.	25 cu.ft.
Total Cost per Mile Flown	$0.3066	$0.3151

PASSENGER COSTS

17. Cost per passenger per 100 miles (assuming full load)	$7.66	$15.75

PACKAGE COSTS

18. Cost per 100 lb. packages per 100 miles (assuming full load and 3 hrs. gasoline)	$3.07	$7.68
19. Cost per cubic foot of space per 100 miles	0.236	1.26

"HOPPING" COSTS

20. "Hopping" passengers carried per hour, assuming 3½ flights of 10 to 12 minutes each	14	7
21. Cost per passenger (assuming full load)	$2.19	$3.15

★These figures comprise the composite operating expenses of several of the largest air taxi operators in the East. They do not, however, include executive overhead, contingencies and business-getting expenses. In studying these figures, therefore, it should be realized that organization and operating conditions vary considerably.

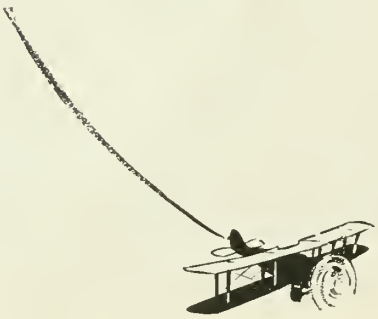
In addition to the increased profitableness of a Fairchild Cabin Monoplane, the *air-going* public is more familiar with Fairchild 'planes because there are more in the air today than any other cabin 'plane. They like the big windows and airiness of the cabin. They feel less nervous sitting in the compartment with the pilot. The seats are more comfortably upholstered, and provide greater relaxation. There is less noise, and therefore more opportunity for conversation. To assist the operators and to multiply air-mindedness in general, Fairchild has launched an extensive campaign of national advertising . . . to let the world know that there's *profit. pride and pleasure* in traveling in Fairchild All-Purpose Cabin Monoplanes.

If you are now engaged in airplane operation, or contemplate entering that field, we'll gladly furnish you with more detailed facts and figures. Fairchild Airplane Manufacturing Corporation, 270 West 38th Street, New York City.

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BOEING



THE Boeing Airplane Company is planning for that time, which is eventually coming, when airplanes will be an accepted mode of speedy transportation, rather than the unusual. A staff of fifty to sixty aeronautical engineers, constantly employed in research, gives some indication of the extent to which the future is receiving attention.

This research is evolving economies in production .... greater safety .... lower operating costs .... higher speeds.

Boeing Airplane Co.

Seattle, Washington

BAG

Mail by Air and Speed it There

What Engine...?

The **PROBLEM**

THE surplus war stock of staunch OX motors is practically exhausted. The popular demand for 110-140 H.P. motored airplanes is increasing phenomenally. What is the engine for this year's crop of low-powered training. commercial and general-utility aircraft . . . . . *and who will build it?*

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The engine manufacturer who successfully serves this market must have more than a proven power plant. His source of materials must be reliable. His factory equipment must be complete and self-contained. His organization must be trained to fabricate, install and service his product.

The **ENGINE** *and the* **ORGANIZATION**

To this solution the Fairchild-Caminez engine is dedicated and backed by a thoroughly equipped plant with the latest precision machinery, manned by an organization trained in every phase of aviation development. Completely manufactured in the Fairchild-Caminez plant—from the analysis of materials to the test block — the Fairchild-Caminez is a simple engine with a big story of achievement. All parts are interchangeable and available at three convenient factory branches.

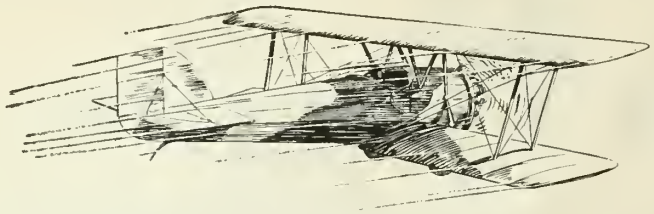
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CAMINEZ ENGINES



An Aircraft Lacquer that will stand up —

THE only clear finishing lacquer we know of that will stand up on wood, fabric or metal and resist the ultra-violet rays of the sun.

You know how you've wanted a clear lacquer—that will resist the treacherous workings of aircraft surfaces; that will stick on and be durable; that will go over colored lacquer, keep a bright finish, and wear; that will resist the ultra-violet rays of the sun on both wood, fabric and metal.

Well, here it is! And here's what else it will do:

Dries with a good gloss.

Has full body and good building qualities.

Has depth of finish.

Improves with age. Sunlight destroys most finishes, but it strengthens this one.

Makes a fine finishing coat over a colored spray lacquer, and gives a brilliant lustre. Will also go over old, well-seasoned varnish.

Mixes with aluminum powder to form a lasting, durable finish. Metallic powders actually "leaf" in Aircraft Clear Flexible Finishing Lacquer.

Positively prevents chalking. Color cannot rub off.

When mixed with colored spray lacquer, it enhances the lustre.

We shall be glad to give you further information on this unusual aircraft finishing product.

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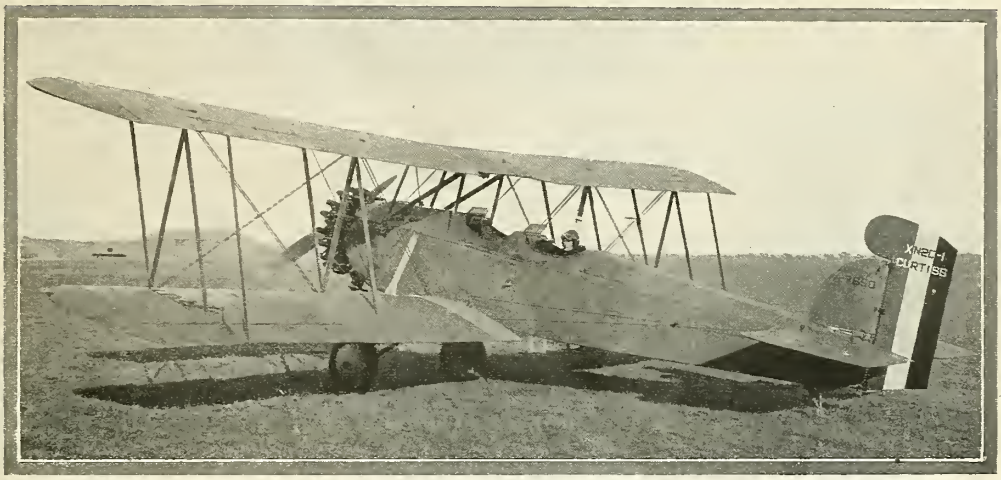
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The Curtiss Fledgling

The Fledgling was constructed as the winner of a Navy design competition, in which fourteen leading aircraft manufacturers participated.

It is specifically designed for primary and advanced training, either as a land plane or as a seaplane, and is equipped for fixed or flexible gunnery instruction, radio spotting and bombing.

In design and performance, the Fledgling is eminently representative of 1928 standards for training planes.

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1st —*to pilot a plane across the Atlantic* (the famous NC-4).

—*to fly from North to South America.*

—*to fly to the head waters of the Amazon.*

Formerly Crack Flying Instructor for the Navy

One of the first of all outstanding, nationally known, present day Aviators to rise to fame was Lieutenant Walter Hinton. But he is more than a great flier. He is a recognized writer and instructor as well. During the War, Hinton was one of the crack pilots to be picked for the Navy's important work of instruction. He knows Aviation from years and years of study; from hundreds of thousands of miles of flight; from close contact with its recognized leaders. His course has been pronounced by authorities as the finest that could possibly be produced. Few men are qualified as he is to help you get your start—and to advise and direct you in the future.

UNDERNEATH every real job Aviation has to offer — and remember, the industry has fifty highly specialized branches — there must be a foundation of KNOWLEDGE. Those who have this foundation are the ones who are going to pick off the choice positions — the biggest money — the finest opportunities. How to get this necessary training — how to get it inexpensively — how to get it quickly and conveniently — those are the important questions this message will answer.

Get Your "Ground Work" Quick—at Home

Stay where you are—keep on with what you're doing—but give Walter Hinton a portion of your spare time. If you'll do that, he'll give you a practical training in Aviation that you would have to spend years and years to acquire through experience. He'll teach you all about types of planes and their uses; theory of flight; designing, construction, rigging, instruments; motors; navigation; aerodynamics and a whole lot more. His course of instruction begins where Aviation began and brings you right up to the minute. He'll show you how to cut off years in your hop to success. He'll help you get into Aviation—he'll help you get ahead in Aviation. He'll give you a solid FOUNDATION OF FACT that you can cash in on for life.



Hinton on the Amazon

Lieutenant Hinton was the first Aviator to use a plane for purposes of exploration. Here he is shown on the Amazon river making friends with the curious natives. On this flight, he and Capt. Stevens of the Army mapped 12,000 square miles of South America's wildest jungle country.

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Commercial Aviation's highly paid positions that are waiting to be filled right now, today, run into the thousands. And in addition to the hundreds of manufacturing, sales, service and transport organizations that are already in the field—new ones are getting started every day. Which means that MORE pilots, MORE expert mechanics, MORE construction men, MORE salesmen, MORE instructors, demonstrators and qualified specialists are needed MORE AND MORE all the time. No need at all to decide today which branch you'll want to follow later. But THERE'S GREAT NEED TO DECIDE TODAY that the chance Aviation offers you is far too big to pass up—and that with Hinton's help and backing you're going to get ready QUICKLY for one of its Better Positions.

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Bohnalite castings are more and more being used in aeroplane motor construction.

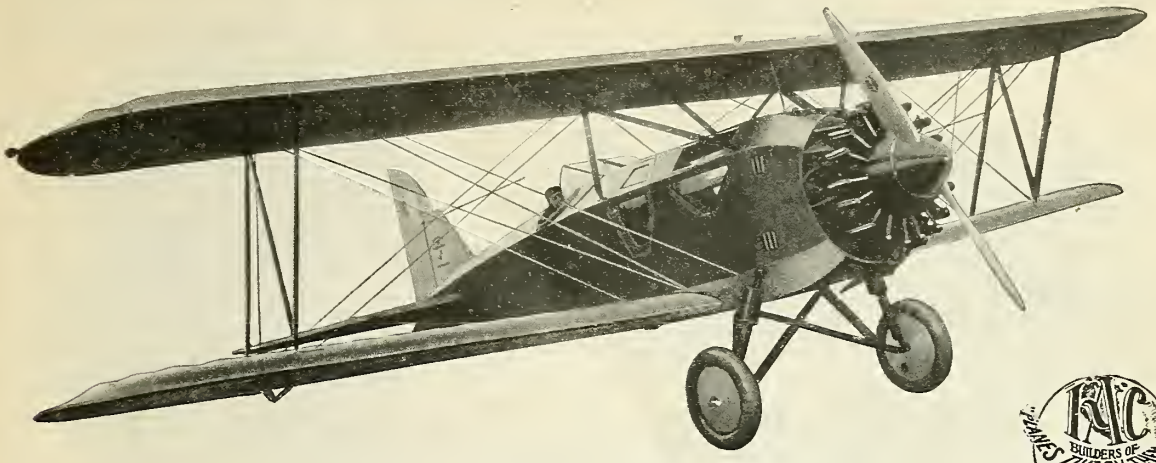
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The high quality construction and streamline design of the Air-Coach, its marvelous performance in speed, stability, and safety are typically International. Still this big cabin ship, because of efficient quantity production methods, costs but $11,000 in the air, completely equipped with 200 H.P. Wright Whirlwind motor. Correspondingly lower priced of course, with less expensive motors. We would like to send you free our new illustrated treatise on this and other International models. May we?

The F-17 "Sportsman", another International model, is an ideal 3-place open plane, identical in design and construction to the Air-Coach, but slightly smaller. $2,750 without motor.

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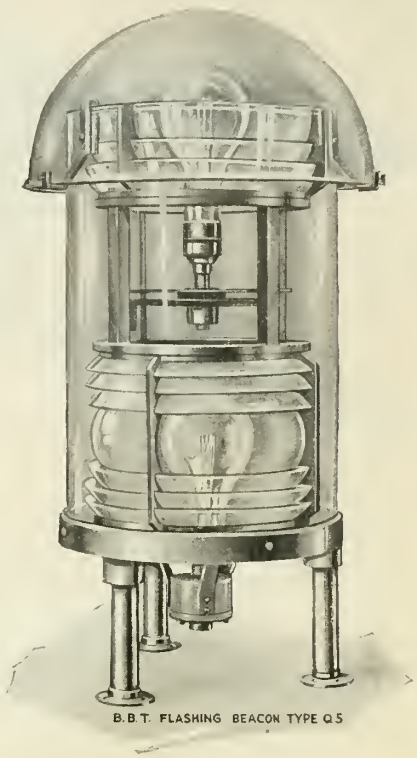
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B.B.T. FLASHING BEACON TYPE Q.5

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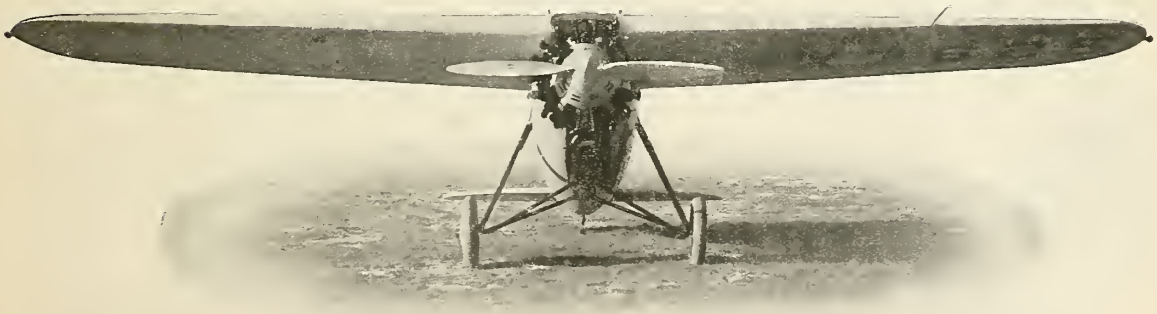
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The Revelation is designed to give the utmost in passenger comfort and is in every way suitable for present day commercial work.

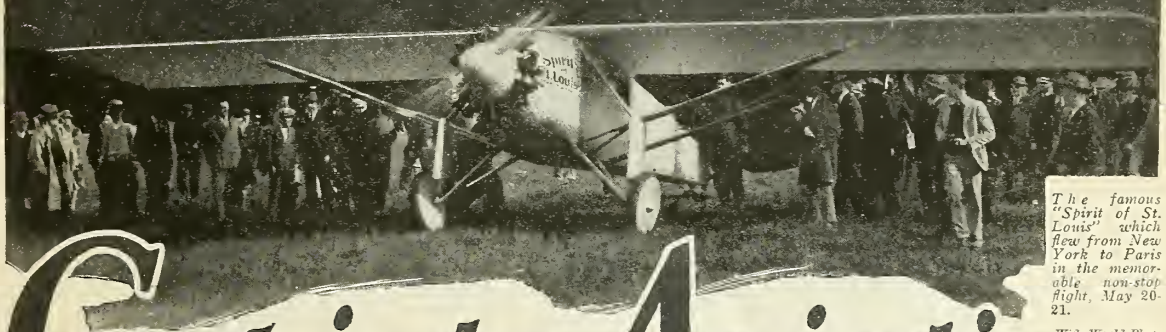
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Wide World Photo

Get into Aviation

WHAT thrill could compare with this—what sport could bring you the tingling, breath-taking adventure of this fascinating, new occupation—the game for men with sporting blood! See life—win applause—thrills—big money—step into a field of excitement and daring—away from the monotony of tame, narrow humdrum everyday life!

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Aviation is growing so swiftly that one can hardly keep track of all the astonishing new developments. Air mail routes have just been extended to form a vast aerial network over the entire U. S. Airlines and airplane factories are springing up all over the country. Men like Henry Ford are investing millions in the future of commercial Aviation in America! The possibilities are so tremendous that they stagger imagination!

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Get into this thrilling business at once while the field is new and uncrowded. Now—by a unique new plan—you can quickly secure at home, during spare time, the preliminary training necessary to get a start in the Aviation Industry. Experts will teach you the secrets—give you the inside facts that are essential to your success.

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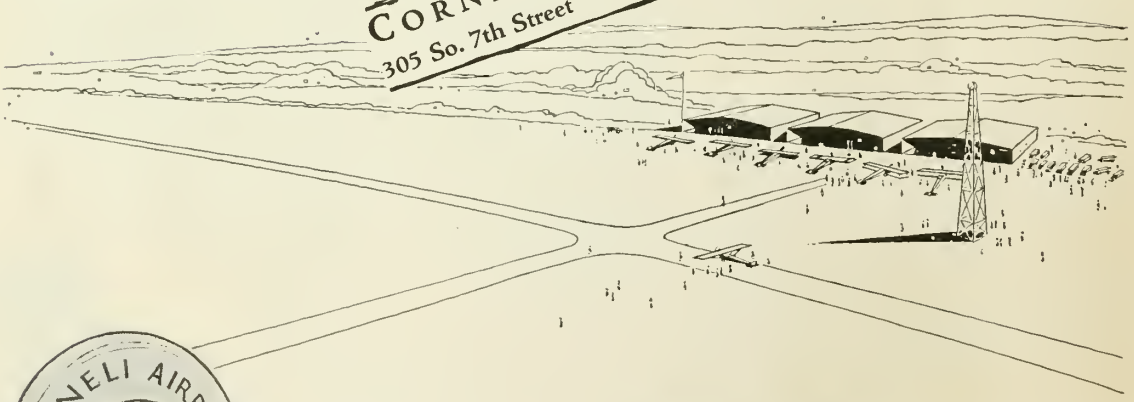
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Here's a grass seed compounded by men who know what airports need—by men who are both aviators and seedsmen.

It develops quick growth, long roots and tough texture. It resists the onslaughts of rough landings. It does not easily burn off or tear out.

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Pilots are demanding *Seesall* not only for safety but also for the hour after hour comfort it assures. Wear this goggle two or three minutes and you forget you have it on. The single ply pneumatic rubber mask hugs the face without discomforting pressure—and yet there is not the slightest air leak anywhere.

Although created by the foremost makers of non-shatterable glass, *Seesall* is made of plain curved glass. If desired, you can wear *Seesall* over your own spectacles.

There are *Seesall* dealers most everywhere. But if you cannot find one, mail us your check for $15.00, and you will get your *Seesall* prepaid by return mail in a handsome metal case. With light tinted lenses, if desired, at the same price.



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Companion to the Celebrated Seesall with Non-Shatterable lenses

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The Two Most Popular Non-Shatterable Goggles

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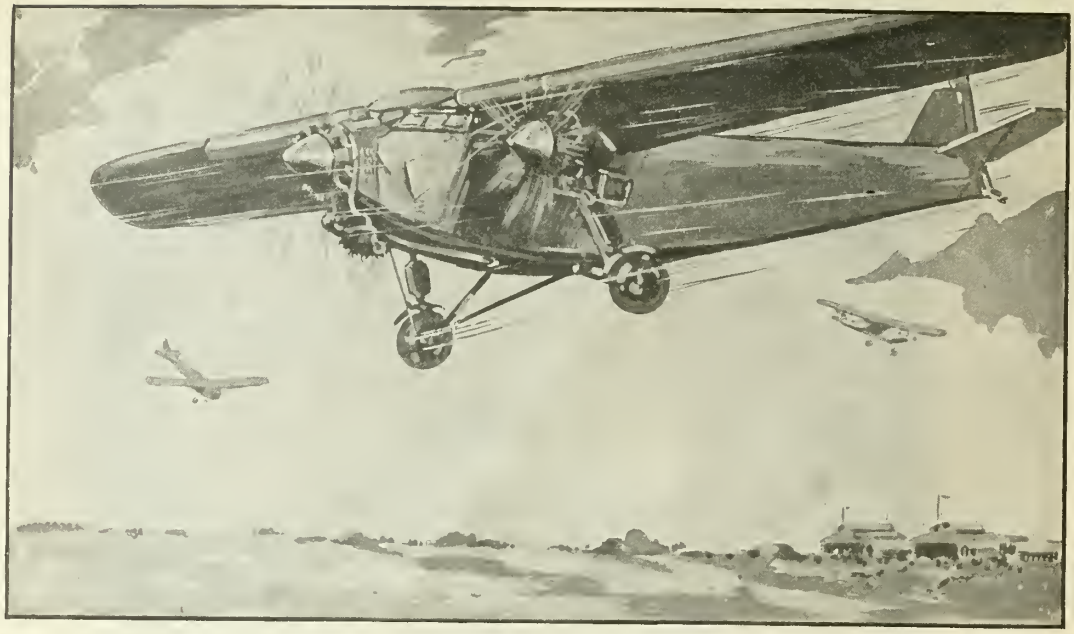


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HYVIS, thru its ability to hold its high viscosity and a uniform, dependable pressure under almost any operating conditions, has gained recognition, from the Ford-Stout and Wright organizations as well as other leading manufacturers, as a lubricant giving maximum protection to aero motors. It is a quick-warming, free-flowing oil that saves much delay in getting off of the ground.

HYVIS is available at practically all distributing points. If your oil dealer cannot supply you, write to us for name of distributor.

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'Well Away!

A Center of Interest at the Aircraft Show

THE PITCAIRN SPORT MAILWING

High interest in a sport plane having wide speed range, comfort, and maneuverability was aptly demonstrated by the large number of enthusiasts who inspected the ship at the Detroit All-American Aircraft Show in April.

Except for the conversion of the mail compartment into a separate passenger cockpit and the addition of a baggage compartment behind the pilot's seat, the Sport Mailwing is identical with the Pitcairn PA-5 Mailwing,* duplicating its familiar features of construction and performance. It is powered with the Wright Whirlwind J-5-C engine, and is furnished with the instruments and equipment indicated.

Price, fully equipped at Bryn Athyn, Pa., $9850. Send for illustrated literature and complete specifications.

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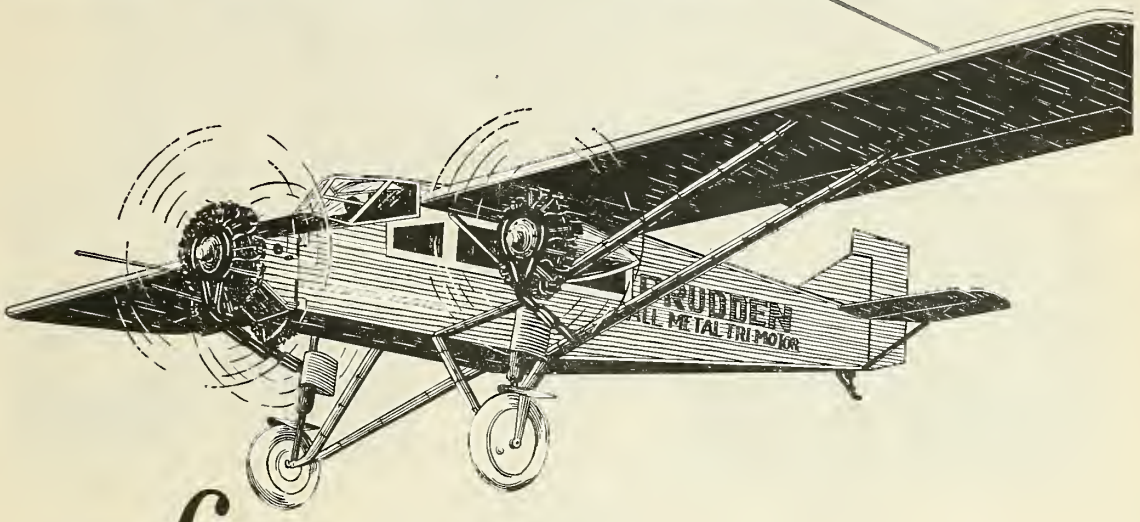
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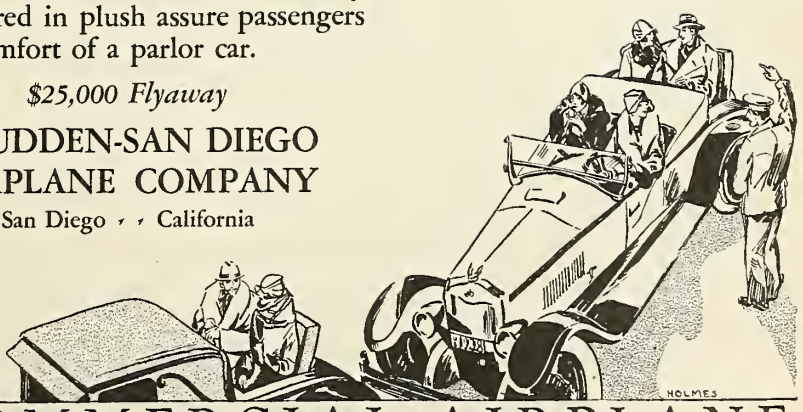
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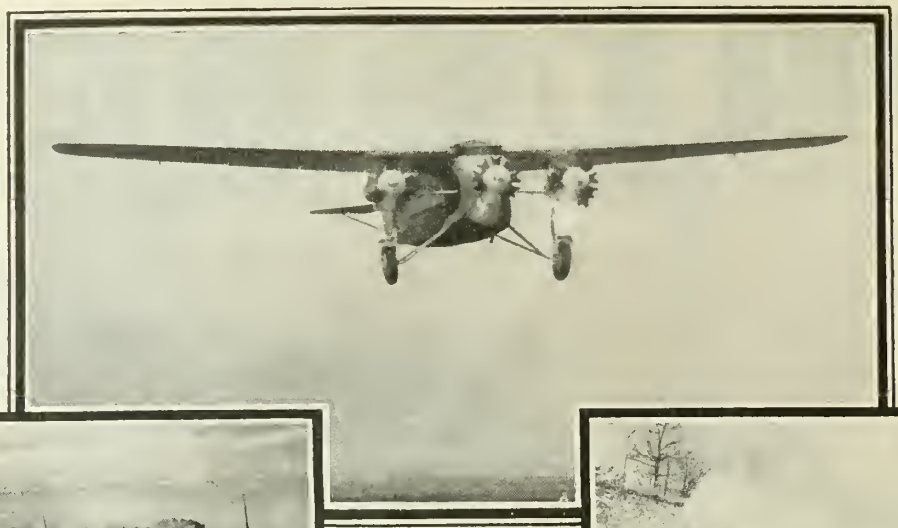
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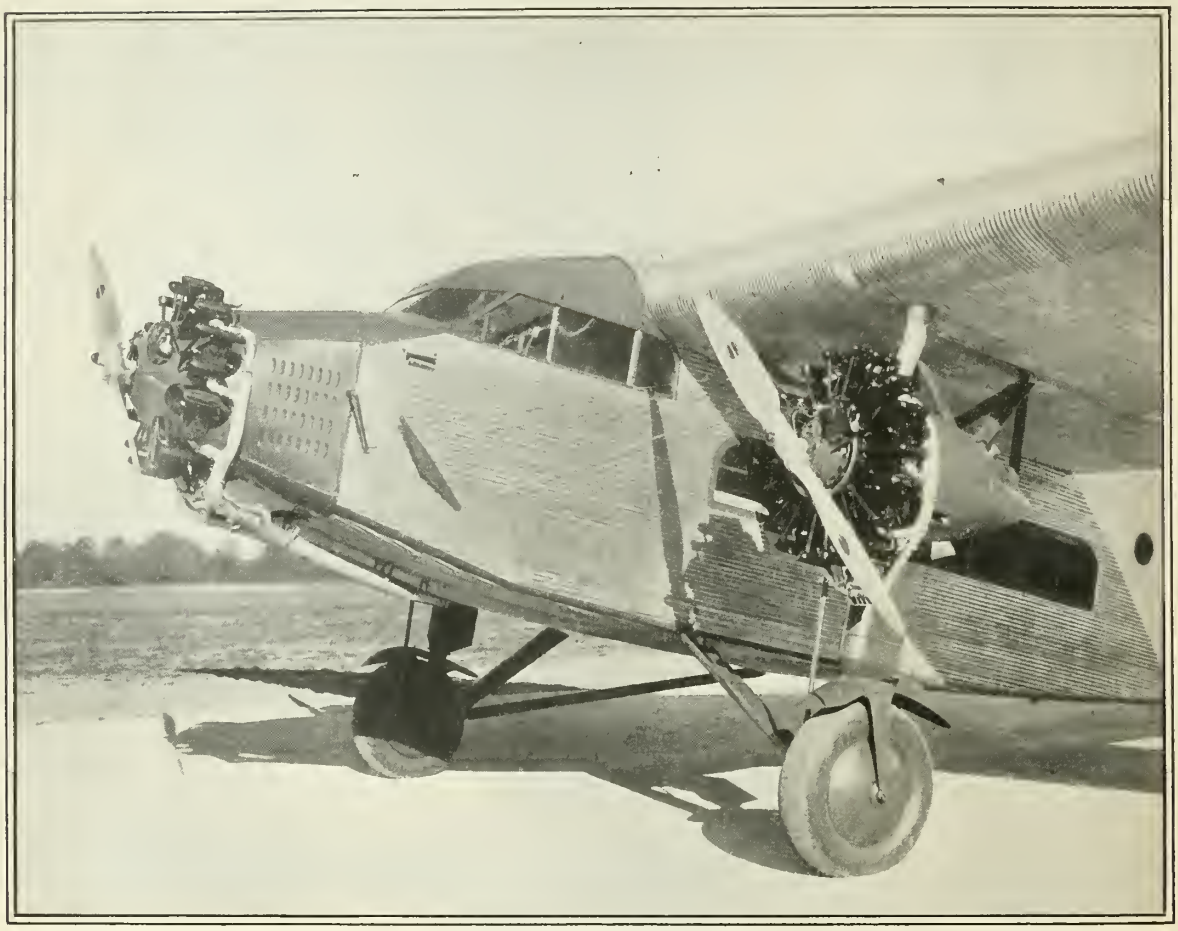
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Volume 12
No. 5

AERO DIGEST

MAY
1928

THE MAGAZINE OF THE AIR

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International.

WILKINS AND EIELSON TAKING OFF ON THEIR 2200-MILE FLIGHT FROM PT. BARROW TO SPITZBERGEN

THE WILKINS ARCTIC EXPEDITIONS

By A. M. Smith

Detroit News and North American Newspaper Alliance correspondent, Detroit News—Wilkins Arctic Expedition, 1927

THE Eskimos of Barrow would say that Captain George Hubert Wilkins "knows his muktuk." Since 1914, they have called him "Anakluto," which means "strong-wise-man."

How many white folks have called Wilkins a fool, because the exploratory efforts of the Wilkins expeditions of 1926 and '27 failed of their objective, that is, a series of flights over various areas of the Arctic Ocean, with landings and the gathering of scientific data?

No one has made the count of the smirkers and critics. They at least served to amuse Wilkins, for he is too well acquainted with the fickleness of the thrill-hunting public to be disturbed by the carping criticism of the ignorant herd.

More than once I have said to the man who guffawed at the Wilkins expeditions of 1926 and '27: "Mr. Man! Go on up to the Arctic. Get into the comforting temperature of 40 below zero. Go out over the most desolate, threatening—and threatfulfilling—place on the face of this earth. Go in an airplane. Get an Arctic blizzard to help you go and to prevent you from returning. When you get there, feel of your pulse—if you can still feel. And when you get back—if you ever do—tell us what kinds of fool you were."

"Sure!" replies Mr. Man. "Anyone is a fool to go there like that."

Today, the highest award of the American Geographic Society, the Samuel Finley Breese Morse gold medal; a flood of congratulatory messages from all parts of the civilized world, some from crowned heads, and many from friends who never misunderstood Wilkins' purpose and mission in the aerial exploration of the Arctic, and know him for what he is, "Anakluto," are the answer to "Fool" from the ranks of the ignorant, fireside smugs.

Sharing in the honor and congratulation of the world, is Wilkins' gentlemen friend, Carl Ben Eielson, more gentleman than a college and two university courses could make him, though he had that training. Eielson, like Wilkins, was born with the soul of a gentleman, with all the finesse of modesty, sense of proportions, tenacity of purpose, quiet and efficient performance which born gentlemanliness implies.

Neither Wilkins nor Eielson were ever interested in aviation stunts. The most skillful piloting under the most difficult conditions in the history of aviation has been Eielson's contribution to the new science of the air.

In all the plans and work of the three Wilkins Arctic Expeditions, both Wilkins and Eielson were interested solely in gathering new and useful knowledge about a large and important unexplored area of this earth. How important such knowledge would be, if gained, they fully understand, as all scientifically-minded people do. They knew they had the sympathetic and understanding backing of the small minority of people—the scientists—and with that they were content to go ahead, merely amused by the critics and the hoi poloi who said: "Fools."

I have digressed at the outset in this outline of the work of the Wilkins Arctic Expeditions because, after all, the human element is at the heart of anything interesting to thoughtful people. And because, with all the real friends of the two "heroes of the hour," I take vast comfort in looking over the former critics who today are "eating up" the news about these two men, and I smack my lips as I wink one eye at them. There is a deal of comfort in "I told you so."

However, the critical attitude of the world that acclaims the man who goes through a hero, and condemns the same man as a fool if anything stops him from going through, had a certain unhappy effect on the plans of Wilkins in the early months of preparation for the expedition of this year. it left him out in the cold, so to speak.

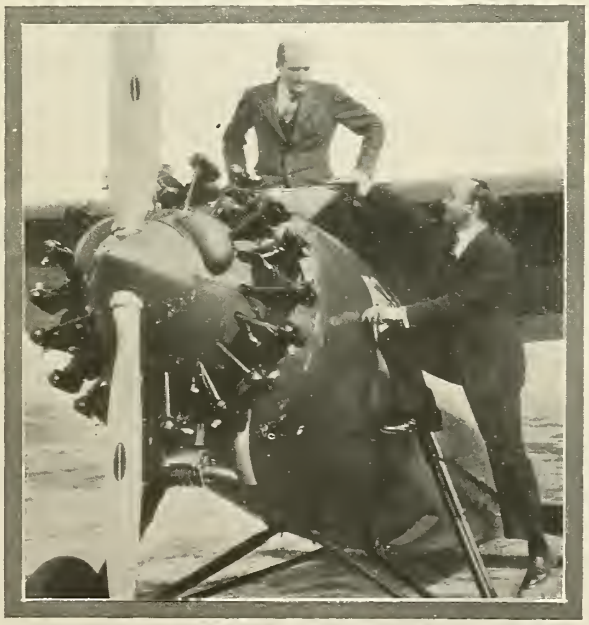
It threw him back on his personal resources in financing the expedition, and he had invested virtually all of his personal fortune in the expeditions of 1926 and '27. The excitement and romance of those two expeditions had passed. Neither of them had gained the results hoped for. There were some friends who doubtless would have chipped in to help finance this last flight if Wilkins had undertaken the rôle of salesman. Personal pride and dignity, and the dogged independence which is always the other side of the shield of Courage, doubtless stopped him from making any appeal for financial aid.

The three Wilkins Arctic Expeditions of 1926, '27, and '28 covered more than 17,400 miles in flights above the Arctic Circle, with the loss of only one plane (Stinson biplane) in exploratory flights; the destruction of one Fokker wing in a test flight at Fairbanks, Alaska; the loss of one man, Palmer H. Hutchinson, Detroit News and North American Newspaper Alliance correspondent on the 1926 expedition, who stepped back into a whirling propeller of the tri-motored Fokker on the landing field at Fairbanks; and the loss of one finger, from freezing, by Eielson, chief pilot, on the 1927 expedition.

The total personnel of the three expeditions was 20 men—11 in 1926; 7 in 1927; 2 in 1928.

Major Thomas G. Lanphier, of Selfridge Field, on the 1926 expedition covered approximately 1,000

(Continued on page 874)



Capt. Wilkins and Eielson (in cockpit) and the Lockheed plane in which they flew from Point Barrow to Spitzbergen on their memorable flight of April 15, 1928.



The Transatlantic Junkers Monoplane "Bremen."—P. & A. photo.

THE "BREMEN'S" FLIGHT TO AMERICA

THE first westward non-stop flight of an airplane across the North Atlantic nearly ended in disaster before the wheels were three feet off the ground. A runway 4,000 feet long had been constructed at Baldonnel, the military flying field on the outskirts of Dublin. The wall surrounding the military reservation was removed and the runway extended into pasturage lands that lay beyond. The heavily loaded *Bremen*—its total weight was 8,140 pounds at the take-off—was unaided by even a breeze. If anything there was a slight tail wind. Captain Hermann Koehl, who flew heavy bombers during the war and who since then has spent much of his time flying almost equally heavy passenger transports, was at the controls. The ship had used nearly all of its runway, the tail was up, the wheels barely touching the grass and Koehl was raising her carefully, by inches.

Then a sheep appeared on the runway and started to browse directly in the path of the nine-foot propeller. Koehl saw the animal, lifted the ship, and made it. There was another obstacle, a large tree, just ahead but the all-metal plane was climbing now and cleared it by a matter of a yard or less, or so it seemed to the little group of Irish Free State officers and their friends who had gathered at the airdrome for the start.

Among those who had gathered for the take-off were William T. Cosgrave, President of the Free State Executive Council, and Mrs. Cosgrave, Herr G. von Dehn, the German Consul General in Dublin, Mr. Desmond Fitzgerald, the Irish Minister of Defense, and brother officers of Major Fitzmaurice.

With Captain James Fitzmaurice (since then elevated by the Irish Free State to a majority in recognition of his accomplishment) pointing out landmarks, and Baron Guenther von Huenefeld, whose restless energy, personal fortune and enthusiasm for flying had made the attempt possible, more or less buried among the benzol tanks in the dark fuselage, Koehl drove the low-winged monoplane for the Galway Coast and thence along the coast toward Slyne Head Light and out to sea.

Slyne Head was the last land they saw until daylight the next morning thirty hours later and the first half of the water jump was uneventful. Variable winds prevailed, and for the first 400 miles after leaving land the weather was fair. Sometimes the wind helped them a bit coming from the east and southeast. Then it would veer into the west for fifty or a hundred miles but it was never strong enough to give the fliers either great joy for its assistance or anxiety because of its opposition. From time to time they corrected drift by dropping smoke bombs and circling as they watched. According to Fitzmaurice they also obtained a very fair estimate of wind velocity by this maneuver. Their speed



Acme photo.

Capt. Koehl, Major Fitzmaurice and Baron von Huenefeld.

for this part of the trip they estimate at slightly better than 100 miles an hour.

About four hours out they encountered their first change in weather and from that time on until within 400 miles of Newfoundland or as it turned out, Labrador, they ran into frequent snow and rain storms and cloud banks. None of these were extended over a big region. Some of them they drove through and they went around others.

One incident occurred to break the monotony of the endless expanse of blue sky and sea during that first morning. The motor sputtered! But it was nothing of importance. One of the pilots in adjusting his mixture had "leaned" it a trifle more than the Junkers L5 could stand. This was remedied quickly, and the *Bremen* continued serenely on its way into the west with first Koehl doing the flying and then Fitzmaurice, each pilot taking the stick for about three hours at a stretch. As the load came slowly down away from the danger point they began to frequently change their altitude, seeking out levels close to the water when the wind shifted for a time into the west, and going higher to get as much help as they could from the wind when it favored them. Thus they ranged up and down from fifty feet to two thousand.



Wide World photo.

Major Fitzmaurice, Floyd Bennett, Duke Schiller and Bernt Balchen with the trimotored Ford at Lake Ste. Agnes, Quebec.

There was little for the Baron to do. Now and then he passed out coffee and meat sandwiches. Some of the time he slept and again busied himself with his pen writing verse or prose, seeking to set down for posterity just how it felt to be the first passenger ever to fly westward across the North Atlantic. Hitherto, while preparation for the flight had been going on, his dynamic energy had been expended to the utmost and now the enforced inactivity began to be trying. At 5 o'clock in the afternoon he stepped to the door leading into the cockpit, his monocle at its most formal and proper pitch, and announced "Tea."

About this time the wind came about into the southwest. For some time it had held steadily from the southeast gradually increasing in velocity until the white caps were piling up below them.

Then as the sun was climbing all too fast down the western sky trouble loomed up ahead. The wind increased in violence and shifted into the southwest. As close as they could judge they were about 400 miles out from the North American coast for ahead was the first real fog they had encountered. It blanketed the water below them and reached up like the Himalayas above them. They started to climb the ship and went up to 6,000 feet without being able to get over it. Then it grew cold and they went down again, down to within fifty feet of the waves where the going was exceedingly bumpy.

It was in this situation that darkness overtook them and affairs were further complicated by the discovery that their lighting system was not functioning leaving their instrument board in darkness. Now and then they used a flashlight but only for moments at a time. They did not dare to stay so close to the water here because they knew that they were approaching land so up they climbed again to 6,000 feet. These hours in the clouds and fog and cold proved one thing of great importance it is believed. Either ice does not form as easily on the corrugated duralumin leading edge as on some other forms of construction or the thick coating of paraffin which was painted on just before the take-off or the combination of corrugated metal and the oil was an efficient defense against it. Further flights, not necessarily transoceanic, of course will be needed before this theory can be accepted by builders as absolute fact. The idea is interesting, the results of this test encouraging.

The night wore on and finally they flew out of the fog and saw the stars from which they at once discovered that they were still flying westward.

For two hours more they kept to the westward course although they knew that they should have crossed from sea to land some time before. Then with the help of flares they discovered that they were over land. For some time both pilots had been watching broken patches of what they thought was low fog. By the flares they learned that they were over vast snow covered forests and rolling hills with mountains ahead.

The fact that they were over Labrador indicates that during the hours of blind flying they had been steadily making northing. When they should have bent their course to the southwest they were probably not willing to trust their compasses which had been showing the effects of the magnetic changes and so they kept on. The head winds had been causing them to use up more fuel than they had figured and at times they were running their motor to the



The Fairchild FC2-W monoplane, piloted by C. A. "Duke" Schiller, the first airplane to reach the "Bremen."

point where their airspeed showed 130 miles an hour. Such a speed eats the gas.

Shortly after sunrise the fliers came to the conclusion that they were many miles inland over Labrador and they swung around into the southeast holding on this course for four hours. Thus they arrived over Greenly Island, saw the lighthouse, circled and came down to a landing on a tiny reservoir in its center. Koehl made a perfect landing but the ice failed and the ship nosed over.

They had been thirty-six hours and thirty minutes in the air. They had crossed 2,000 miles of open water and, while exact data is not available, they probably cruised over 800 miles of land striking Belle Isle Straits one or two hundred miles to the south of the point where they left the sea for the land.

The rest is well known; how the light keeper, Johnny Le Tamplier, his buxom wife and six children, to say nothing of a dozen or so Newfoundland puppies and sled dogs, rushed out to greet them. How they were made at home at the Le Tamplier fireside while Johnny sent word to the Point Amour wireless station several miles across the straits on the mainland.

They landed about 1 p. m., on April 13 Eastern Standard Time, but it was 7 o'clock that night before the waiting hundreds at Mitchel Field whose numbers had dwindled from thousands in the last hours before darkness learned that they were safe even though 1300 miles from their announced destination.

At once Miss Herta Junkers, the energetic daughter of Dr. Hugo Junkers, now on his way to this country, started to organize a relief expedition, although it was not known in New York just how much the *Bremen* was injured.

Preparations to start planes northward were made at Curtiss Field, at Hartford and by the Canadian Transcontinental Airways. On the evening of the fifteenth a Junkers mechanic started north by train taking with him a complete landing gear for that of the *Bremen* had been badly damaged. Struts and wheels were bent and the axle was cracked. The propeller tips also were bent.

After several attempts made abortive by storms Duke Schiller and Dr. Louis Cuisinier flying a Fairchild-Pratt and Whitney "Wasp" job made the flight to Greenly Island and the next day he started back with Fitzmaurice for spare parts. They were forced down at Natashquan on the Banks of the St. Lawrence but two hundred miles from Greenly.

It was April 18 when Duke Schiller finally set his plane down on the ice of St. Agnes near Murray Bay where Fitzmaurice made known the needs of the fliers and their ship to Miss Junkers.

Meanwhile the Ford expedition, Floyd Bennett's last flight, was getting under way at Detroit. Both Bennett and his fellow flier, Bernt Balchen, left hospital beds to fly the tri-motored Ford into the frozen north. When they landed at Murray Bay on April 20th, Bennett had to be helped from his plane and two days later he was lying in a Quebec Hospital close to death. He was not destined to live to see the accomplishment of this rescue expedition but Balchen carried on.

April 23 he took off with a heavily loaded plane carrying benzol, spare parts, Ernest Koeppen of the Junkers Company here and Charles Murphy. He landed at Greenly. It was found that the engine of the *Bremen* had suffered from exposure and that take-off conditions for wheels were impossible, so regretfully the German-Irish crew decided to abandon ship until a later date and fly down in the Ford. They landed at Murray Bay, April 26 to learn that Bennett had died the day before. At once a pall of gloom enshrouded everyone. The *Bremen's* crew decided that they would go on to Washington for the funeral but at New York, because of storms, they left the Ford ship and went to Washington by train, too late for the services. The next morning after laying wreaths on the grave, they returned to New York. In so far as possible they avoided greetings on that day, Saturday, April 28.

The reception on April 30 was unique. Not so boisterous as Lindbergh's, not so noisy as that to returning troops after the war.

But it had its own great significance. It brought home to the millions who took part and to the Irish-German crew of the *Bremen* that peace between great nations had come again.

Transatlantic flights may be useless stunts as far as aviation is concerned. Some "experts" avow this over and over but the great gift of aviation to the world is clearly realized in them because it so graphically illustrates how the airplane brings peoples closer together.

A word about the ship itself and its motor. The *Bremen* is a Junkers, type W33, low wing, cantilever, monoplane powered by a Junkers 285-310 horsepower six cylinder in line water-cooled engine. It has a span of 58 feet 6 inches, a length over all of 34 feet 6 inches and a height over all of 9 feet 6 inches.

Its weight empty is 2640 pounds, useful normal load 1990 pounds, total load 4630 pounds. Its wing area is 463 square feet, wing loading 10 pounds to the square foot, power loading 15 pounds to the square foot.

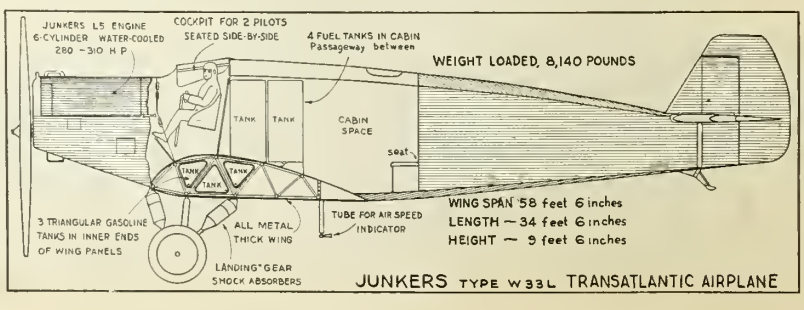
For the ocean flight its total load was 8140 pounds, wing loading 17.6 pounds, power loading 26.2 pounds.

It has a normal high speed of 123 miles per hour, but can be pushed faster. Its cruising speed is 97 miles an hour, landing speed 53 miles per hour. Its ceiling is 19,000 feet and its actual climb from 3300 feet to 6500 consumes 5 minutes and 30 seconds.

The Junkers Aero engine L5 is a recent development of the Dessau laboratories. Its weight is 690 pounds. The six cylinders have a bore of 6.3 inches and 7.5 inch stroke. The fuel used on this flight was a 90 per cent benzol compound and the engine was adjusted for this fuel with a compression ratio of 7 to 1. Its standard compression ratio is 5.5 to 1.

This engine draws the intake air to the carburetor through the crankcase. Additional warming is provided by water jackets on the carburetor bodies. A double throat Zenith carburetor is used; it has an auxiliary air control for altitude flying and for economical cruising when flying with a partially closed throttle.

The fuel load for the ocean flight was slightly over 600 gallons.



AIR—HOT AND OTHERWISE

The Detroit Show

By Frank A. Tichenor

HENRY FORD missed a trick by being with the English royal family during the week of the Air Show in Detroit. But heaven knows he has a right to be wherever he may choose. Though he was not on hand to see the biggest show that ever happened in American aviation—in aviation as a whole, in fact.

From now on the United States will know which one of its cities to turn to when it wants real accomplishment, whether in the automotive industry, aircraft, or, probably, anything else. If Detroit does it it will be WELL done.

Sponsored by the Detroit Chamber of Commerce not a trick was missed. Every member of the show committee was every minute on the job, in every way, on every day—and night. Everyone was doing his best, too, for the general idea; there was no sign of private jockeying for individual advancement or preference of position. Team work! The exhibitors as well as everybody else were striving for the show, for aviation and for the United States rather than for themselves. Here was real harmony of purpose—said purpose being to show the world that aircraft manufacture is a going business—going with a speed unknown in previous history, exactly as the planes it manufactures go.

The public? Air-minded to a man, woman and child is the public of Detroit. The paid attendance (75 cents each) was more than 150,000. Business? Millions of dollars worth of actual sales were made, many of them to private, previously non-flying individuals. The private plane will be the regular thing, not in a few years, but from now—NOW—on. Interest? You should have seen the youngsters—from twelve years up to twenty-one. Boys and youth of the great automotive metropolis there on the Lake know more, today, about aircraft, than any others in this nation or elsewhere on the globe.

It will be recalled by those who have read AERO DIGEST that we in this shop always have been optimistic about the future of aeronautics. But on the Sunday morning when I walked into that hall I was stunned by the immensity of the exhibit. It is literally true that chills chased up and down my spine. Proud? Proud as a peacock are we all because we have been fortunate enough to have had some small part in advancing an industry that means so much to the United States and, indeed, to civilization.

When, many years ago, I stopped writing sports I vowed that I would never use the word "superman" again. I never have till now. But when I looked at that colossal evidence of what an industry of which the actual foundation was laid just less than a quarter of a century ago, when Wright flew at Kitty Hawk, I broke my resolution, for it is the solemn fact that these Detroiters must be supermen. I shan't try to give a roster of them, but a few so undeniably demand mention that I must pull their names from my dazed mind. One cannot omit those of Bill Mayo, Harvey Campbell, Carl Betts, Ray Cooper, Harry Graham, Harold H. Emmons (the father of aviation in Detroit), Ed. Kramp, Smiling Jack Harding, the able representative of the Aeronautical Chamber of Commerce, and every blessed soul (able mind, hustling disposition, constructive imagination—these are all better terms) that played any part in the astounding competence evidenced in this great show.

What a lesson to the balance of the country! It will profit by it, too.

The Government supplier, realizing that his market necessarily must be comparatively small, in future, though he had everything his own way very recently, realized perhaps for the first time that America, all of it, is awake to aviation. It must have been a shock and a delight to such men, some of them real pioneers, to see before their eyes the evidence that in this A. D. 1928 every family in this whole country is a prospect for the purchase of a plane.

I cannot enumerate the things I saw with thrills of satisfaction even greater than I had expected. Engines, for example—old ones, new ones and not a one which has not a potential place in the tremendous market which is surely opening up. Old types of planes, new types of planes—sport ships, mail ships, cabin ships, amphibians—all adapted to commercial production, perfect in design and workmanship, even painted up and finished off as perfectly as the best of Detroit's original product—the finest automobiles in the world. Yes, even as to luxury of fittings! America proposes to be comfortable, almost sybaritic in the air as well as in its surface transportation.

It was a great chance for the manufacturers to get together and talk about as well as see each what the other chap is doing. This was done in an astonishing spirit of friendship and coöperation.

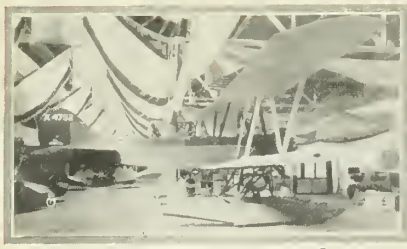
Those manufacturers who had exhibits probably wholly failed to realize what generous contributions they were making towards the education of that fortunate swarm of youth which was in actual attendance. In a few years the boys of now will be the nation's master minds, not only will they be the fliers, but they will be the manufacturers; not only will they be the voters, but they will be the men the voters vote for. It was an inspiration to me to watch them come in to that great show.

Aviation? It was there before their eyes, and anyone could see that they had not before then realized what a mighty structure of hard fact the romance, the adventure, the exquisite thrills have played a part in building.

I believe Henry Ford, if he had realized what was to happen, would have waited before going to Europe. I am very glad he went; I am glad he was received by King George and Queen Mary and the Prince of Wales. More good-will as the result of aviation. But I wish he might have seen that great show in Detroit in the creation of which he played so large and wonderful a part.

Another man who would have gloried in it was obliged to miss that show. "Bill" MacCracken, Secretary of Commerce for Air, did wonders in promotion and advance arrangements of all kinds. He supplied much of the splendid impulse which throbbed there among the planes. Illness kept him from the place above all others where in normal circumstances he would have wished to be. Everybody missed him and nearly everybody took the pains to say so.

General Fechet was there and Major "Tom" Lanphier. And, oh, yes, from the Navy—well, from the Navy—ahem! Well, Secretary Wilbur (you know who I mean, don't you?)—well, he was somewhere else, I don't know where. And all the other dignitaries, bignataries and general wigwagnatories of the fleets, ironclads and swivel-chairs must have been with him. The show, perhaps, was far too full of aeronautical enthusiasm to make it an agreeable or sympathetic place for them to visit.


Eaglerock seaplane with Edo floats.


Hamilton all-metal monoplane.


Travel Air OX5 with Edo floats.


Alexander Eaglerock.


Stinson Detroiter seaplane.


Bellanca Model CH.


Aero Supply Mfg. Co.


B. B. T. Corporation.


Eclipse Starter Co.

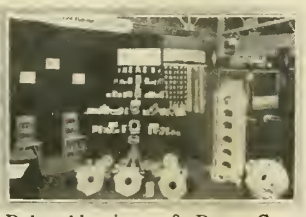

Kendall Refining Company.



Keystone Aircraft Corp.


Excello Mfg. Company.


Stefco Steel Company.


Bohn Aluminum & Brass Corp.


S. K. F. Industries, Inc.


Aviation Motors Corp.


Berry Brothers.


Packard Motor Car Co.


Waco 10s—Advance Aircraft Co.


Aerocraft.


International F17 and F18.


Ford-Stout Tri-motor.


Ryan Brougham


Vought Corsair (U. S. Navy).

All photos by Kalec & Forster.

A FEW OF THE AIRPLANE AND ACCESSORY EXHIBITS AT TH

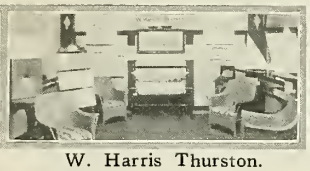

Gordon & Ferguson, Inc.


Westinghouse Electric.


Ford-Stout.


Wright Aeronautical Corp.


A. G. Spalding & Bros.


W. Harris Thurston.



Radio Corp. of America.


Goodyear Tire & Rubber Co.


Buhl Air Sedan.


Spartan.


Monocoupe.


Wallace.


Driggs Dart.

Stearman.



Taylor Brothers Chummy.


Aerocraft Aero-Coupe.



Overcashier.


Pitcairn Mailwing.



American Eagle.


Ireland Amphiplane.


Lenert all-metal.


Westinghouse Lamp Co.


Standard Steel Propeller Co.

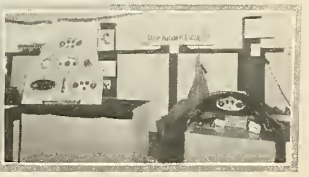

Russell Mfg. Company.


Haskelite Mfg. Co.


Norma-Hoffmann Bearings Corp.


A. C. Spark Plug Co.


Canvas Leather Specialty Co.


Elgin National Watch Co.

All photos by Kalec & Forster.

ALL-AMERICAN AIRCRAFT SHOW, DETROIT, MICH., APRIL, 1928

RECORD ALTITUDE FLIGHTS

By
H. B. Henrickson
Assistant Physicist, Aeronautic Instruments Section U. S. National Bureau of Standards

MANY attempts were made during the past year to fly not only long distances, but also to high altitudes. Several altitude attempts were made by balloon, and as many more by land planes and sea planes, with and without useful load.

On March 9th at Scott Field, Belleville, Illinois, Captain Hawthorne C. Gray, U. S. A., stepped into his 80,000 cubic foot hydrogen-filled balloon with his present-day high altitude equipment, among which were the life-sustaining oxygen apparatus, two high grade dual traverse barographs, and a thermograph. Much depends upon the latter recording instruments, for they tell the story of the flight by making a continuous record of the atmospheric pressure and temperature upon a smoked chart. Just before each official record flight, the instruments are carefully sealed by a representative of the contest committee of the National Aeronautic Association. Immediately after the flight the instruments are forwarded to the National Bureau of Standards in Washington, D. C., where the altitude determination is made with great care by duplicating flight conditions in the laboratory.



H. B. Henrickson checking an altitude flight barograph.

It may be well at this point to describe in detail the method of testing at the Bureau of Standards. Upon receipt of the instruments at this Bureau, the seals are broken in the presence of a member of the National Aeronautic Association. The instruments are carefully examined, the smoked charts are removed from the drums and "fixed" by dipping into a mixture of collodion and Duco-solvent. Several fixing solutions have been used, but the Duco-collodion mixture has been found most satisfactory for the following reasons: the chart does not shrink, it dries soon after immersion, the fixative is non-peeling, and it photographs well.

The fixed chart is replaced on the barograph which has been selected as official.

The instrument is then placed under a bell jar and given a flight-history test in which the temperature and pressure and their rates of change during the flight are duplicated. Inside of the bell-jar are coils of copper tubing for the circulation of carbon dioxide which reduces the temperature from that at the start of the flight to that at the ceiling, at approximately the rate shown by instrumental data obtained during the flight. A fan keeps the air within the bell jar in circulation against the cooling coils. Starting with the stylus of the pen arm on the ground pressure line of the barograph chart, the air is exhausted within the jar at a rate approximately the same as that shown by the barograph trace until the lowest or ceiling pressure of the flight is reached. At this point a reading is taken on a standard mercurial barometer which is connected to the bell jar. The ceiling pressure is then converted to altitude by means of the Fédération Aéronautique Internationale (F.A.I.) pressure-altitude table, which figure represents the height attained for international comparison. If the new figure exceeds the international record, the F. A. I. is officially notified through the National Aeronautical Association of all details of the flight, together with the original barograph chart and a copy of the Bureau of Standards report on the altitude determination. The National Aeronautic Association is the representative of the Fédération Aéronautique Internationale in America.

Two barographs are usually carried in altitude flights in order that at least one good record may be obtained. In the particular flight made by Captain Gray on March 9th, the clockwork of one of the barographs stopped at a point near the ceiling of the flight where the temperature of minus 35 degrees Centigrade experienced was low enough to congeal the light oil in the bearings of the clockwork. On the way back, however, the clock started to run again due to increasing temperature as the balloon approached the earth. The other barograph continued to function perfectly throughout the flight of two hours, giving an especially fine trace on a smoked chart. A trace made by a stylus on a smoked chart is preferable to a pen with ink in that there is then no danger of the ink freezing or of the trace sputtering out. Modern high altitude barographs are equipped with an ingenious mechanism which allows the pen arm



A dual transverse barograph with temperature recorder.

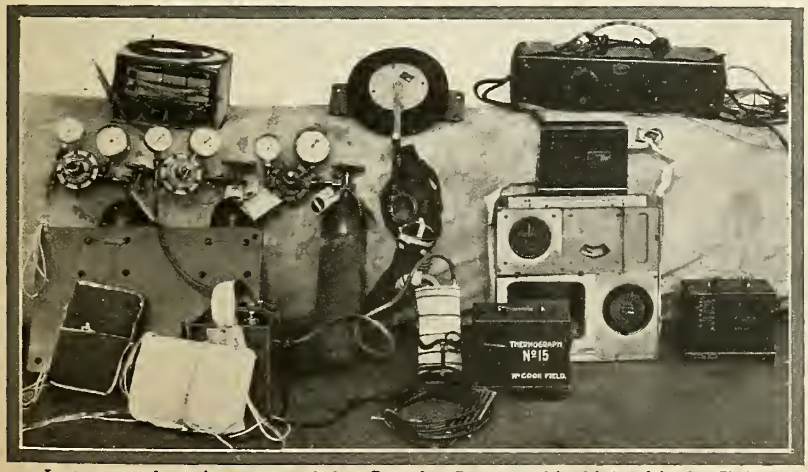
to move down and back again over the entire chart with decreasing barometric pressure. This dual traverse feature gives the barograph a very open pressure scale, indeed so much so, that each sudden increase in altitude due to unloading ballast can be noted in the instrument's record. This sensitivity to pressure change was of extreme importance in detecting whether Captain Gray was still conscious at the ceiling of a later flight made in November. The barograph used on this flight of March 9th was carefully checked at the Bureau of Standards. When compared with a standard barometer it showed a minimum or ceiling pressure of 234.9 millimeters of mercury. From the F. A. I. pressure-altitude table, 235 millimeters of mercury is equivalent to 8,690 meters, or to 28,510 feet. (F. A. I. rules require that the pressure be taken to the whole millimeter.) This flight, although far enough up in the region where it is necessary to breathe oxygen, did not approach the balloon altitude record of 35,424 feet which was made in 1901 by the German aeronauts Suring and Berson. Captain Gray, however, made other flights at later dates, one in May and then the unfortunately fatal one in November.



Captain Gray, in flying togs, prepares for an altitude balloon ascension.

On the afternoon of April 14th at the Naval Air Station, Anacostia, D. C., Lieut. G. R. Henderson, U. S. N., made an altitude flight in a Vought "Corsair" seaplane, carrying a useful load of 500 kilograms. The ship was powered with a Pratt & Whitney "Wasp" air-cooled engine of 425 h. p. Two barographs were carried, similar to those used by Captain Gray of the Army. No thermograph was used, but a temperature of minus 10 degrees Centigrade was noted by the pilot on reading a strut thermometer when the ceiling of the flight was reached. The pressure at this point as recorded by the official barograph was 312.3 millimeters of mercury. From the F. A. I. table 312 millimeters of mercury is equivalent to 6,760 meters or to 22,178 feet. This was a world record for a seaplane carrying a useful load of 500 kilograms.

On May 4th at Scott Field, Belleville, Illinois, Captain Gray again took off in his hydrogen-filled balloon of Class A, Category 7, determined this time to capture the altitude record as well as to make further radio and meteorological observations in the sparsely explored upper atmosphere. He carried the same recording instruments, two barographs and a thermograph, that he used on his former flight. This time it happened to be the clockwork of the thermograph that stopped running not so long after the take-off. Although the clockwork stopped, the temperature element continued to function, causing the pen arm to describe a single arc on the smoked chart. The lower end of this arc, when the instrument was compared with a standard thermometer, indicated a minimum temperature of minus 55 degrees Centigrade. The clockwork of one of the barographs also stopped for a short time, due to the extremely low temperature experienced just after the ceiling of the flight was reached. The other barograph, however, continued to function perfectly throughout the flight and was consequently selected as official. When nearing the ceiling of his flight, Captain Gray experienced pains in his chest and following the instructions of physicians valved gas soon afterwards, starting on a rapid descent toward the earth. When only several thousands feet from the ground, he noted that he was falling at so rapid a rate that a crash was imminent, hence he was obliged to take to his parachute and jump. This procedure immediately lightened the balloon which gain shot skyward for a while, coming down not long after Captain Gray, who had landed in the meantime with his parachute. As a result, no injury came to man or instruments. The jumping-off point is well defined in the barograph trace. On this flight the minimum pressure attained was 122.2 millimeters of mercury. According to the F. A. I. table, 122 millimeters of mercury is equivalent to 12,944 meters or to 42,470 feet. This record, however, was not allowed by the F. A. I. because the pilot jumped, and consequently "was not in possession of his ship and instruments" on landing. Captain Gray, still undiscouraged, made another attempt on November 4th.



Instrumental equipment used by Captain Gray on his high altitude flight.

On May 5th, the day following Gray's flight, Lieut. Carlton C. Champion, U. S. N., made an altitude flight at Langley Field, Virginia, with a Wright Apache seaplane. The plane was powered with a Pratt & Whitney "Wasp" engine, of 425 h. p., supercharged. All altitude planes, of course, are equipped with some type of supercharger, otherwise there would be a

more decided falling-off of engine power with increasing altitudes which, in turn, would mean a lowered ceiling for the plane. This plane was equipped with the Root type supercharger, developed by the National Advisory Committee for Aeronautics at its experimental station at Langley Field. On this flight two dual traverse barographs were carried but no thermograph. In view of the fact that no temperature data were furnished, the temperature of the instruments at the ceiling of the flight was assumed to be minus 30 degrees Centigrade. In this flight both of the barographs functioned perfectly from start to finish. The pressure recorded at the ceiling of the flight was 186.8 millimeters of mercury. From the F. A. I. table, 187 millimeters is equivalent to 10,197 meters or to 33,455 feet, which was a world record for a seaplane. Some trouble was experienced due to the overheating of the supercharger, or the plane could have continued to a higher altitude. An examination of the barograph trace indicated that the ship was still climbing when it was found necessary to descend, and that a possibility of a much higher ceiling was to be expected.



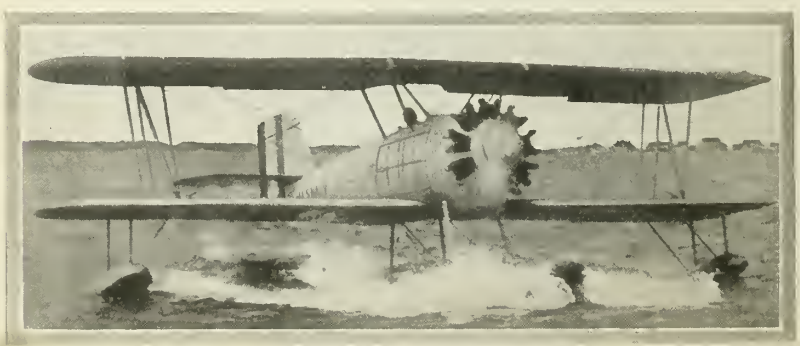
The PN-10 carried a load of 3,500 kilos to a height of 6,588 feet.

On July 4th, Lieutenant Champion made another altitude attempt at the Naval Air Station at Anacostia, D. C., using the same seaplane. The same two barographs were carried, but as on the previous flight, no thermograph. The instrument temperature, consequently, was assumed to be—30 C. One of the instruments was mounted not far from the engine; the other was mounted closer to the cockpit, on this side of the fire-wall which is simply a metallic partition between the engine and pilot. The probable variation from the assumed temperature, however, would not introduce an error exceeding 2 or 3 millimeters of mercury in the pressure determination. This case does not emphasize, however, the need of a device for recording the barograph temperature. Such a device, consisting of a coiled bimetallic strip mounted near the sylphon and terminating in a recording pen has been developed by the author and has been installed recently on a number of high altitude barographs at the Bureau of Standards. On account of the instrument's inherent temperature errors, the need for such a temperature recording device is obvious when accurate determinations of altitude are desired. On this occasion the barograph showed a ceiling pressure of 150.6 millimeters of mercury. From the F. A. I. table, 151 millimeters of mercury is equivalent to 11,581 meters or to 37,995 feet. This was a world record for seaplane, bettering Lieutenant Champion's own performance of May 5th at Langley Field, Va., by 4,540 feet.



The Apache as a landplane (38,418 ft.) and as a seaplane (37,995 ft.)

On July 25th, at the Naval Air Station at Anacostia, D. C., Lieutenant Champion in the Wright Apache, now converted into a landplane, took the air once more,—out for a new altitude record. This flight provided thrills far beyond expectation. Soon after the ceiling of the plane was reached, the pilot, needing oxygen, made a precipitous dive for earth. The resulting excessive speed was more than the engine could stand. Seven out of the nine cylinder heads were blown out, parts flew in all directions tearing holes in the wings, but fortunately missing the pilot. Soon afterwards, the plane caught on fire but it was quickly put out by side-slipping the plane. Before the pilot reached the ground, however, the plane again caught on fire several times, but each time the flames were extinguished by the skillful maneuvers of the man at the controls. Champion felt certain that he had made a world record, and wishing to preserve the barographs as well as the lives of the people in Washington who might be in (*Continued on page 882*)



The Corsair reached an altitude of 22,178 feet carrying a load of 500 kilos.

LETTERS TO UNCLE FRANK

By Don Rose

THIS series of letters written by Don Rose to the publisher of AERO DIGEST *gives the meditations of an air-minded layman during his sojourn in a New York hospital. We think you will agree that these letters are a worthy substitute for his regular article this month.—Editor's Note.*

* * *

April 16, 1928

Dear Uncle Frank Tichenor:

Well, it looks as though this might turn out to be a good joke on somebody, though I hate to think just who the joke will be on, but here I am in a hospital and with not the faintest idea when or how I'm going to write my piece for you this month, particularly since I'm here for an operation and from the general festive air of this place I wouldn't be at all surprised if I woke up tomorrow in another and maybe better world, though we fellows in the aviation business mustn't expect too much of the hereafter, having had a pretty good time in the here, all things considered. But whatever happens, I know right now that I won't be fit to live with for a while after the alterations and repairs. I've had friends who have gone in for operations in a more or less serious way, and believe me, those birds rightly needed another to stop them talking about it afterwards, for an operation is very much like going to jail, as Uncle Cy Caldwell will tell you, in that it's not much fun but it certainly does make conversation. I've come to the conclusion that people go to hospitals for about the same reason that they go to Europe—so that they can come back and lie about it for the rest of their lives; and I don't have much hopes of being any more reticent than the rest of humanity, particularly since nobody ever yet accused me of keeping my mouth shut when there was the slightest excuse for opening it.

I suppose this is a perfectly nice, respectable and sociable hospital, but there's certainly no great excitement about my arrival here. Why, I might as well be at home for all the notice anybody takes of me. My nurse, by the way, is a blonde, but I don't like the way she looks at me. She looks almost as if she might be measuring me. And the doctor is too darned cheerful to be encouraging; he looks as though *he's* going to have a good time out of this, anyway. Of course, I'm behaving as though this is the sort of thing I'm used to every day of my life; I've smoked a couple of Murads and tried to look as nonchalant as an army pilot stepping out of a pancaked pursuit ship with a crowd of scared spectators gawping at him, but I'm not sure that I'm getting away with it. And I ask you—how can a fellow keep his poise and nonchalance in good working order when they take away all his clothes and leave him with nothing but half a suit of pajamas and a pair of hospital socks? (Here are the original pants bandits.) I was never so sketchily dressed since I lost my suitcase that night on the B. & O. Railroad—but I'll tell you about that some other time. If I was that nurse, I'd be ashamed.

I'm really feeling a whole lot better since I got here, and if I could only find my clothes I believe I'd go home. I've just come to the conclusion that people have too many operations. But they've got me here, and I want you to know they took my room rent in advance, which don't look so good does it? Or does it? And if you don't hear from me pretty darn soon, I want you to come on over here and get a rebate. There's no sense in my paying rent here if I'm up somewhere sitting on a cloud and twanging at a harp. Now is there?

There's a fellow just come to the door in a Ku Klux uniform with a sort of wheelbarrow. I've got a low-down hunch that he's come for me. So if you will excuse me, I'll bring this to a close, and maybe you'll hear from me tomorrow and maybe you'll just hear about me.

* * *

Same day, later

Dear Uncle Frank:

I'm writing this from somewhere up in the ether, where these doctors have put me for reasons of their own while they get personal with my insides. I thought you might like to hear about it, and you can pass it on to some of these altitude hounds, so that if they get their elevators jammed and climb clear out of the atmosphere into the ether they can know what to expect. They took me up to the room where all the machinery is, and there were three doctors looking too much like butchers in white coats and aprons to make me feel entirely at home with them, and I pretty near remembered an important engagement and went home, but I didn't know where they had hid my shirt. And there was another nurse there and I didn't like her looks either, even though she was a blonde as far as I could see. So I passed out one of those jesting remarks for which I am so justly famous and nobody cracked a smile, and then they turned on the gas.

So the first thing I knew I felt like a passenger who has asked for loops, spins and all the works, and has already realized that it was a mistake. And a little later I began to feel like a Quiet Birdman at about half-past ten of a nice evening, and I think I might have sung a song only I couldn't think of any words. And then I began to feel airy and light-headed like a blimp, or an angel for all I know, and about that time the ether hit me and I went out, and here I am. And now I feel like a Congressman.

It's very nice and peaceful up here in the ether, though I don't know exactly where I am. I forgot to bring along my earth inductor compass, and somehow I hate to figure my position by dead reckoning—it seems a little presumptuous. Maybe I'm over the North Pole or maybe over the South Pole, though they say there's a whole world of difference between them. But I think I'm somewhere over Newfoundland or maybe Hawaii, and I don't care much. Anyway, it's nice up here; there don't seem to be any bills to be paid and I don't have to read newspaper editorials about the future of aviation, and in regard to all earthly matters I feel like a busted Klaxon in that I don't give a hoot. For three cents I'd stay here, though perhaps it would be nice to have a little company. The nurse don't seem to be around anywhere.

* * *

April 17, 1928

Dear Uncle Frank:

Well, here I am back from the ether, and we certainly had a nice trip, though the deviation of the magnetic compass was something awful, and I flew the last thousand miles or so through thick fog. Right now I'm resting easily and waiting for the booking agent from King Features to come around and sign me up for a series of articles for the newspapers, and after that, maybe, I'll write a book and give a few lectures for the sake of the advancement of our glorious profession of aviation and such small change as I can pick up on the side. Somehow they've got me back in bed and I have all my pajamas again and I don't like to think too much about that. *(Continued on page 875)*

AERO DIGEST

Published Monthly
THE AERONAUTICAL DIGEST PUBLISHING CORPORATION
220 WEST 42nd STREET
NEW YORK

Vol. 12 MAY, 1928 No. 5

FLOYD BENNETT

REAL fliers never fear the unknown. Their very art is that of penetrating into realms which to the men of other generations were behind closed doors of human limitations. Floyd Bennett now has made, so far as we can tell, his final flight—that journey into the eternal mystery which all must make, but which few make so splendidly.

He took off undismayed and at his great journey's end he will make whatever landing waits upon the field for a good fellow, gentleman, loyal friend, loving and beloved human being, true and expert exponent of the art of aviation. The Air Klan salutes his memory!

THE IRISH-GERMAN FLIERS

FITZMAURICE, as Irish as the shamrock; Koehl and von Huenefeld as German as Unter den Linden. What an unexpected yet what a perfect combination—German precision, Irish initiative and gallantry. When, on Friday, the thirteenth, we had heard nothing of them, we were worried but we still had hope. We didn't know just why—but there was an Irishman aboard that plane! If fighting or strategy could bring them through we were completely certain that they'd land somewhere—and right side up—with at least one of them, the Irishman, grinning.

All honor to them! It must be borne in mind that they've done something which can only be done once. They've done it the first time!

Just as we have frequently predicted, the world will really get acquainted for the first time in all history through the influence of aircraft. Good-will fliers—good-will flying—Lindbergh to Pan America, the Germans and the Irishman to the United States.

And let's think back. Don't let's forget the splendid, tragic daring of Nungesser and Coli, who sought our shores from France, and, going further back, we may very well remember that magnificent English dirigible which flew across the sea and back again!

THAT ANNIVERSARY

THE twenty-fifth anniversary of human flight in heavier-than-air machines, the epochal exhibit of the Wright brothers, comes next December. Nothing definite in the way of planning a fit observation of this anniversary—one of the most significant in the history of the human race, and absolutely all American—has been done yet. If that which is done is not fitting in its magnitude and its imagination then this nation will have missed an opportunity.

IN THE SMITHSONIAN

THE *Spirit of St. Louis* is now where it belongs, in the Smithsonian Institution. It is one plane which even the Smithsonian cannot deny, one achievement that even the Smithsonian cannot question. Even those old wiseacres of Washington admit that Lindbergh did it first.

We of AERO DIGEST hope to live to see the time when that Smithsonian group will grow in mental strength until they are fit to acknowledge their mistake, admit the injury that they have done to one of the greatest of Americans. Then, perhaps, we may see Wright's first machine and Lindbergh's *Spirit of St. Louis* side by side in a Smithsonian which truly is the nation's treasure-house, perpetual reminders to all future generations of Americans of the achievements of the great pioneers.

This, by the way, is Lindbergh's month. Don't forget it.

A PLEA FOR MR. WILBUR

MORE Wilbur! How long, oh Lord, how long? This time he calls the battleship the backbone of the fleet and aircraft (also submarines) mere auxiliaries. None are so blind as those who will not see.

But Wilbur, fighting air defense, well knows that he is licked. Otherwise he'd not be cruising all about the country trying to win favor for that at one time useful adjunct of the national safety, the now defunct battleship.

Perhaps we should ignore all this, considering that it comes from him, for memory of his Chicago speech of just about a year ago showed his paucity of information on this subject, and indeed, upon most subjects. But some may not know.

He admits that long range gunfire is dependent upon aviation; what he seems to be too blind to see is that the long range guns won't fire because there will be, over them, enemy planes supplying a grim rain of bombs. The battleships, will be like Wilbur and the ostrich. It will be remembered that the ostrich, when attacked, buries its head in the sand but remains otherwise exposed. It feels safe then, until—the spanking comes. The battleship will not even know just when to duck and could not duck even if it knew. The planes which will astound it with their bombs will be so high in air that they will not be visible, even with Mr. Wilbur's strongest spectacles.

We would suggest for Mr. Secretary Wilbur a correspondence course in aeronautics. Walter Hinton, who sends out a very good one, is convenient to the Secretary's reach. Right there in Washington, is Walter, on Connecticut Avenue. We know him and we like him. He's a charitable cuss. He'd be right glad to help the Secretary. If he wants pay for teaching Mr. Wilbur (and we admit that he should) AERO DIGEST will head a popular subscription for the education of the Secretary of the Navy.

Lindbergh, the Frenchmen, the Germans, the gay Irishman, and all the others who have shown the way have not been able to impress the Secretary. Even the considerable group of officers who (for the brief moments of his term of office) serve under him apparently remain unknown to him. We regret this circumstance. So we are mailing to the Secretary of the Navy cards of introduction to Admiral Moffett, Commander Richardson, Commander Rosendahl and a few others. Any one of these or many others would be glad to take an afternoon away from less important duties, lead the Secretary out to Anacostia and explain to him the rudiments of human flight.

If he remains in office till the end of the next war he probably will get an airplane from the enemy country which (if he stays in office) will have licked us. Having got it he will suggest its careful study. The trouble will be, if and then, we fear, that should Secretary Wilbur stay in office through another war there would be nobody left to study anything when it was ended.

A NOD AND A WINK

Roaming Roomers
By
Cy Caldwell

"CY, we want you to go to Detroit," said the charming Editor of AERO DIGEST. "We want you to write a full account of the All-America Aircraft Show—the fuller the better. Don't miss a thing, now will you? Here's a ticket on the Detroiter, and here's expense money. Spend all you like, and stay as long as you like; but don't fail to cover the show fully."

"Rest easy!" I said. "You may consider the job already done. I'll hand you the fullest account ever written of anything."

And I have kept my word, though not exactly in the way the Editor intended, and not quite as I had intended, either. In fact, I started to slide from my appointed course the moment I got aboard the Detroiter.

There's a train for you! If hi-jackers ever held up that caravan they'd be made for life. Every stateroom had It. To go from the observation car to the diner I passed 87 Canada Dry and White Rock bottles. And they were not unaccompanied. Accompanying one quart that I had the pleasure of meeting was Pilot Hardin, former Waco distributor in Florida. We spent a delightful evening of social chatter, in company with Mr. and Mrs. Bellanca—who weren't taking anything but the ride—and the well-known Spoons Boedecker, who will take anything at all. We felt, all of us, that we had made a good start for the Oil-America Aircraft Show.

But to get right to the Show itself, I must confess that my ideas of that amazing affair are somewhat hazy as I accidentally got mixed up with a flock of rooms at the Hotel Statler and simply spent the most of my time wandering from room to room in a very Socialistic and Spiritualistic mood. It was just like going through a maze—I simply couldn't get out of that hotel. Time after time I started for the elevator; but it was no use. A door of somebody's room would open—and in I'd go. When the door didn't open of its own volition, I opened it myself. If the Statler has a room left that I haven't been in, I'd like to see it as a curiosity. Also, if they hold that Aircraft Show again, I'd like to see that, too, because I missed it this time.

Not that I didn't try to see the Show—I tried hard. I even went into the Convention Hall—I think I got past the first booth. Or I got nearly to the first booth, when Frank Bogart of Detroit said, "Have you visited the Pouritin Club?" Well, we instantly sounded the retreat and started on the road to ruin with—I forget his name at the moment, but it will come back to me. There we met Captain Woolson of the Packard Co., Lieut. Schildhauer of the Navy, and Colonel Danforth, the new C. O. of Selfridge Field. Woolson drove us out to Selfridge and back—and that was the last fresh air I got until I returned to New York three days later. The balance of the time was spent going from room to room and talking in loud, ringing tones with some two hundred pilots laboring under varying conditions of mental strain and stimulus—mostly stimulus. And I want to add right here that it is my earnest desire that every one of them will drop me a line and send me a snapshot of himself for my department, PersonAIRlities—and please don't blame me if I forget names, because I forgot my room number, and even my home address and telephone. I have a wretched memory, especially when I tamper with it. I recall that the house detective asked me where my room was, and I couldn't tell him. I felt terribly embarrassed. At last, in desperation, I said, "864," hoping he'd let me alone. But the wretched man insisted on going there with me—he said he was charmed with my company—and it turned out that 864 was occupied by a Mr. and Mrs. Hassenpfeffer, entire strangers to me. I was really nonpulsed.

Friday night after the Show was memorable. I was invited to act as master of ceremonies and cracked ice in the Kendall Oil Hangar at the Statler. With Messrs. Shearer, Heyden and Loutt bringing me bottles in relays. I sat at the fountain of justice, wrapped in a bath towel, and poured. And how I poured! I estimate that the amount of muscular energy used by my right arm would have sufficed to lift a column of water one mile—only who wants to lift that stuff? For two hard-working hours I dispensed Canada Dry, Kendall Oil, and cracked ice, in equal proportions; while some 200 odd pilots strained their elbows hoisting the mixture into themselves. In two hours half the boys were doing altitude flights, and the other half were ready to take off. So was the hotel manager, for that matter; and so was the house detective.

Meanwhile George Haldeman arrived and backed me away from the fountain of joy so he and I could sit in a corner and have a chat, because we hadn't met since one night in Frank Godwin's studio in New Hokum on the Hudson, last October. George was then altruistically engaged in starting a little girl off on the road to fame and fortune—he took her as far as a tanker in the middle of an ocean, and she went on from there without him. Since that October night George had enjoyed a cool salt bath and I had done a lot of perspiring in Haiti, so we had lots to talk about. We came to the conclusion that both of us had been soaked enough.

Now, you may not believe me, but I hadn't taken a drink that night until George arrived, when I turned over the cracked ice to Heyden and wrapped my prehensile fingers (there's a seventy-five cent word for you!) around a cold glass, and sunk my gleaming teeth into a pork sandwich. So I was in good shape to observe that the combined noise of that gathering was making the walls bulge. All I can say is that if Kendall oil works as well on engines as it does on pilots, any engine using that happy compound will be well oiled. The house detective also noted this engineering fact, and suggested that some of the crates be wheeled into their own hangars. So George and I started out to clear the field. The general procedure was to go up to a bird and say: "You're looking for your coat and hat, aren't you? And if not, why not?" Thus, tactfully and gently, we cleared the hangar.

When we had banished the last roaring Napoleon to St. Helena, George said to me, "Well, Cy, isn't it about time you and I did a little serious drinking ourselves?" I said I guessed it was, so we bid our kind hosts good-night at 2 a. m. and went to George's room, where we sat opposite each other until rosy-fingered dawn painted the sky at 7 a. m. Now, that's what I call good, sensible, serious glass-work. Two earnest, thoughtful men can really get together and know each other under conditions like that—and I'll defy them to do the

(Continued on page 882)

PERSONAIRLITIES



by Caldwell

SO regularly, so completely, is the mail flown through the worst weather, that all sight of the personal element involved is lost to the public eye. For the air mail has become an impersonal demonstration of efficiency, like the ordinary mail or the telegraph. We take it for granted as Air Mail, and are prone to forget that without the personal element it would not function at all. Neither would the telegraph, for that matter—the personal element is in every one of the world's activities. But you know what I mean—the Air Mail has become so much bigger than the men who fly it that we are overlooking the pilots and are regarding the Air Mail as a whole in much the same light as that in which we regard the railroads. And rightly so, for aviation is bigger than any of its parts, and the pilots are only parts of it. But just the same, in aviation, more than in any other of our activities of movement, the human element is involved; and the qualities of individual courage and initiative of the pilot still play a major part. Therefore to me it is of great interest to know what pilots think and how they feel about their job, especially the old pilots who have spent many years and have given much thought to their work.

Here is Jack Knight, for instance, who writes me very modestly that he is "a timid soul who still gets a good thrill from flying blind." Anyone who knows Jack will get a grin from his description of himself as timid; if that bird is timid, then the rest of us are simply scared to death. But here's his letter:

"Flying the Air Mail by men who have devoted ten or twelve years of their lives to it has in a way lost its glamor and romance, but the position of Air Mail Pilot has by no means lost its fascination and interest. Each and every trip is a distinct, separate adventure, with numerous handicaps and varying weather conditions to overcome. Bucking blizzards, sleet storms, or fogs provides quite a thrill for most of us *in the daytime;* but as 99 per cent of our flying is night flying, these hazards are consequently much harder to judge and fly through.

"To the uninitiated ground man, it is hard to understand how it is possible to get caught above a fog, with no ceiling above and no visibility below. They never will understand how a pilot will battle along in bad weather until he gets caught blind and has to do some tall scratching and maneuvering to get out of it intact. They simply can't understand how a storm or fog will close up behind you—cutting across your course—and perhaps giving you a few anxious moments.

"The writer of this note is a timid soul that after ten years of mail flying and about 6,000 hours still gets a good thrill from a 400-mile trip above a fog, and gets quite a few additional heart-beats from ten or twenty minutes' blind flying. My experience of blind flying consists of trying to catch up with my compass, staying right side up, etc., etc. Some say it can be done indefinitely—MAYBE SO!"

"WILL ROGERS is a wonderful fellow," Lloyd Yost of Pinehurst tells me. "He places implicit confidence in the pilot and does no back seat driving. I had the pleasure of flying him from Salisbury, N. C., to Pinehurst, where we landed on a polo field. And we were bucking a cross-wind—a change from his usual head wind."

Another trip Yost made with Rogers was from Atlanta to Raleigh, 400 miles, with two Godunks who needed sea-sick bags. Rogers stood the strain all right, that time. But the Godunks used all of Yost's supply of those necessary receptacles, and he doesn't know where to get any more. If any reader knows where those bags may be purchased, will he advise me? I may need one myself one of these days.

PILOT BURT GRAHAM, of the Postal Telegraph Co., Gloversville, N. Y., is suffering from a semi-poetic complex that will be alleviated only by the receipt of that touching little ditty, "Ten Thousand Dollars Going To The Folks," which was written by an orphan with adenoids. If anyone is so unfortunate as to know the words of this thing, send them to Burt and put him out of his misery. Don't send them to me—I'm sad enough now. You might also send him, "Wrap Me Up In My Old Leather Jacket."



Lloyd Yost and Will Rogers

"ON my recent aerial tour of the United States," writes Louis G. Meister of the Buhl Aircraft Co., Marysville, Mich. "I could not help but notice one fact that stuck out from the rest, namely: at every field we landed we were always met by a bunch of young men wearing helmets and goggles. They wore these helmets regardless of what their duties were, whether they were sweeping the floors, closing hangar doors, tightening nuts and bolts, repairing old battered down cars or pushing ships in and out of hangars. I don't know whether they wore their helmets and goggles to bed or not, but I suppose they did. Perhaps they were training their hair to grow in pompadour style? I asked some of the mail pilots along the route why these boys always wore helmets and goggles; and they said they could not figure it out, except that they might have bought their helmets and goggles first, and were saving up their money to buy boots and britches, and after that they probably would consider flying."

This helmet-goggle complex is not confined to the innocent youth upon whom aviation has but recently dawned; it attacks also the seasoned pilot of the adulation-seeking type. I once flew several thousand miles with an ape who had been flying for years, and I found, to my surprise and sorrow, that he had not outgrown the foolish tricks of innocent and excusable childhood. Wherever we landed at a town, I would park my helmet and goggles in my bag, and don an ordinary cap, in which I did not look unlike the usual inhabitant of this globe. My unfortunate companion, however, would tramp through the main streets of the burg wearing helmet, goggles, gloves, leather coat, and field boots. He was quite a treat to the youth of the town, who seemed to get the impression that the fellow had dropped down on some nearby roof and was hurrying to a hotel where he could change his attire. In a large town we would collect no more than a dozen small boys, but in a village where a stranger was a curiosity, we could gather a following of four dozen staring kids in four minutes. The whole performance was exceedingly painful to me, who am by nature rather quiet and averse to show—especially such a confoundedly silly show. I argued with the ape, but to no avail; he wore that outfit all the time in every town. At last, in self defense, I let him go ahead in his circus outfit, and jogged along a good mile behind.

PILOT ROY B. DODSON who startles the yokels of Kirksville, Missouri, with his aerial activities in an Eaglerock informs me that he has triumphed over Nature to the extent of taking off in a foot of snow at Denver and landing in two feet of mud at Kirksville, where he has a field. He says, "Busy last few days getting up a new three-ship hangar."

(Continued on next page)

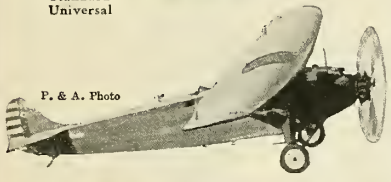


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The first airplane to fly to the Pole—Valsparred, of course! For Valspar is never affected by extremes of temperature.



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PLEASE ADDRESS REPLY TO The Corporation at
Hasbrouck Heights, N.J.
December 1, 1927.

Valentine & Company,
456 Fourth Avenue,
New York, N.Y.

Gentlemen:-

As you know the Atlantic Aircraft Corporation has been a staunch believer in Valspar Varnish for a number of years.

Few people realize how vital a part the finish plays in the durability of an airplane. If proper protective covering is not used, the airplane gathers moisture, thereby reducing greatly its efficiency and life.

The results obtained from the use of Valspar on FOKKER planes built in the last ten years have been so eminently satisfactory that it is a pleasure to recommend your good varnish. We employ it on our flying boats, as well as on our regular airplanes. It has recently been used on a customer's especially designed and constructed flying yacht. We have other customers who distinctly specify Valspar in their contracts.

Yours very truly,

ATLANTIC AIRCRAFT CORPORATION.

BY: A. H. G. FOKKER.

AHGF-HKS

All statements or Agreements contained in this letter are contingent on strikes, accidents, fires or any other causes beyond our control and all contracts are subject to approval by the signature of a duly authorized executive officer of this company; clerical errors subject to correction. Specifications, quotations and delivery dates subject to change without notice.

VALSPAR is depended upon by the aircraft industry generally, to give the needed protection against moisture, extremes of temperature, vibration, gas and oil. Valspar increases efficiency and the life of planes.

VALENTINE'S
VALSPAR
The Varnish That Won't Turn White

(PersonAIRlities continued)

"YOUR article in the January number didn't exactly present our town in its proper light," complains Horace J. Dickinson, American Consul at Antilla, Cuba, who was my kind host for one wild and woolly night during my flights in the West Indies. "You know that we are *not* dead and that your consul here is *not* failing fast. Nevertheless you have shown to the cockeyed world that we have a beer for our aviators and lots of water to taxi around in. We've got a warm place in our hearts for them, too, and you didn't say a word about that. Just for that I hope they put you on a milk diet."



Consul Dickinson

Well now, that's too bad, my dear Consul. What I meant to insinuate was that you were failing, compared to myself and the captain of that molasses boat. We were about seventeen beers ahead of you, weren't we? Or were we? I don't really know. The whole night lingers in my recollection as just so much foam and shimmer and roaring laughter. It was a whale of a night!

I advise any pilot flying to Cuba not to miss Antilla, and not to miss calling on the American Consul. For that matter, don't fail to visit your Consul in any foreign country. They are fine men in a splendid service. They will help you with your Clearance Papers and make you welcome always. No praise is too high for the kindly, helpful men of the American Consular Service.

In the accompanying picture of Consul Dickinson and his mastiff—or perhaps it's a mastodon—the Consul may readily be identified by the hat he is holding.

PILOT EDDIE NIRMAIER was cruising around in his Seagull over Biscayne Bay recently, admiring the City of Miami spread beneath him, and wondering idly how they had managed to sell so much of it to innocent New Yorkers, when he espied a small launch on fire and blazing merrily. As he watched, two men leaped from the burning craft, after throwing a number of white bundles into the water.

Eddie alighted near them, taxied up, and found that the bundles were laundry that the men had collected from yachts to deliver to a Miami laundry company. He picked up the laundry and the two men, while the launch burnt to the water's edge, and sunk. In appreciation of this gallant rescue the laundry company have presented Eddie with a needle and thread with which to sew the buttons on his own laundry when it is returned after their usual ministrations. When they get their new boat, Eddie is to have the honor of initiating it by yanking all the buttons off the first shirt it delivers.

PILOT A. W. STEPHENSON of Butte, Montana, says: "Out here where I am in the great wide open spaces of Montana, where parts of the good state get further apart with every head wind, and higher up in the air as the old OX5 gets older, we have established one formula for the use of all Transport Pilots, as follows: 'The smaller the town, the larger the landing field.' We are searching for a formula that will take the politics out of the hands of the committees delegated to select and purchase landing fields. I thought perhaps you might be able to call on Al Smith and suggest that one plank in his platform be, 'Eight per cent beer and one hundred per cent landing fields.'"

So far as I'm concerned, if they'll make the beer 100% they can make the landing fields what percentage they desire; they'll all look good to me then.

HERE is Jack Ashcraft, pilot of the famous—perhaps "Spirit of Ammonia," which finished in the lucky seventh position in Class B, Spokane Derby. Jack is operating a field at Towanda, Penna., and intends to establish a line from Williamsport to any point in the world. His associates are Pilot Gardner Nagle of Shreveport, La., and Mechanic Alfred McClatchie. Jack was with the Gates Flying Circus for four seasons, after which Towanda must seem pretty tame to him, and quite a rest cure.



Jack Ashcraft

HIGH up in the Sierra Nevada Mountains, close to the Southern Pacific's line of snowsheds, stands a giant pine, its massive trunk scarred and gashed. These wounds bear silent witness to what happened when gasoline and motor severed relations in the Boeing mail plane flown by Pilot R. B. Levisee.

"Flying west from Reno on a blustery day," writes Levisee, expert tree-surgeon, "I climbed to 13,000 feet up and over a void above storm and mountains. After thirty minutes' bucking the wind, somewhere over Truckee, my chosen airway petered out to a mass of sleet and haze. Swinging to the south and down a long rift in the storm gave me free passage to Cisco twenty miles further on. There again my airway ceased to be. A decision was necessary: whether to hop onto a Southern Pacific train going down the mountainside or ride the waters of the American River down into the valley. My beautifully-running Wasp decided the question; it quit suddenly and completely. (I discovered later that water in the gas-line had frozen and cut off the gas supply.) This fact completed all plans—ahead, back, and up—so down I went.

"This direction lasted only for a thousand feet, when the trees on the mountainside got in the way. Using the left wing and several soft-looking pines as a shock-absorber, that trip ended suddenly in a four-foot snow bank. The giant pine made no remarks, nor did I, too glad to be all together to criticize.

"A hasty glance at what had been an excellent airplane was enough. The wings were a total loss, but a husky fuselage of genuine longerons and trusses came through intact. The moral is, so far as I am concerned, 'When water is present in gasoline, don't try to use it to soar around in the air, or you'll end in a snow bank.'"

The further adventures of Levisee might be entitled "Removing the Evidence." He slid, tumbled and skidded down that mountain to the Southern Pacific tracks, and walked a mile to the home of a Dalmation section foreman. There he telephoned for help and lived three days with his kindly host, John Bacarich, while he and Eddie Hubbard, Vice-President of Boeing Air Transport, in charge of operations, with Mechanics Borgard and Burns from Reno, and the section crew skidded the wrecked plane down the mountain and loaded it in a box-car, spotted for a few minutes on the right of way.

I should have enjoyed watching Eddie Hubbard crawling around in three feet of snow, dragging pieces of airplane after him. The last time I saw that philosophic and pleasant old bird he was crawling out of a wrecked training plane that had smacked itself into Pensacola Bay—and he wasn't the least bit disturbed.

THERE doesn't seem to be much sense putting a picture of J. Don Alexander on this page, because everybody knows what that man with a smile looks like. But it isn't here for information purposes; it's just shoved in to brighten up the page. He's a cheerful bird, isn't he I knew him back in the days when he didn't have nearly as much to grin about as he has to-day—and he was just as confident and smiling then as he is now.



Smiling J. Don

In reply to a query of mine he writes: "I have never done anything with an airplane that is worthy of comment, except possibly flying my Eaglerock around the country for about 15,000 miles without an accident. I use it for my business trips because I believe it to be the cheapest, fastest, and most pleasant way for a business man to travel. One thing I have learned is that I am just poor enough as a pilot to fly carefully enough to be safe."

If that last sentence could be printed in big letters and pasted in the hangars of every flying school in the country, all the undertakers would sue J. Don Alexander for driving trade away from them.

(Continued on next page)



WESTERN PENNA.

W. H. EMERY, JR.
DISTRIBUTOR
TRAVEL AIR PLANES

EMERY FIELD
BRADFORD PA.

WESTERN NEW YORK

BUFFALO AIRPORT
BUFFALO, N. Y.

Kendall Refining Co., March 8, 1928.
Bradford, Pa.

Gentlemen:

I have been using your oil for nearly a year and I believe it to be the best oil for the OX5 motor. Before using your oil I had tried several different kinds each of which I used ten to twelve hours without changing. All of these oils needed changing at the end of this time. After using Kendall for ten hours I drained it but found it nearly as good as when I put it in. The next fill I used fifteen hours with the same results. Now I never drain the oil until it has been used for twenty hours.

In the N. Y. to Spokane derby last Fall I flew the fourth machine built by Travel Air Mfg. Co. Nearly all the planes in the derby were new. All of them were streamlined and speeded up for the race with metal propellors, closed in cockpits or high compression motors. I flew my plane just as I had been flying it for over two years. I even had over-sized wheels and tires on it. The fact that I was able to fly this old ship without any preparation into fifth place proved to me its high quality. For this reason I have taken over Western Penna. and Western N. Y. territory as distributor for Travel Air planes.

When I know that the crankcase of my motor is filled with Kendall, I feel confident that my motor is being lubricated perfectly. All of my machines will be filled with Kendall when they leave the factory.

Yours very truly,

whejr/h W. H. Emery Jr.

Fifth Place in a Two Year Old Plane on Kendall

BEFORE W. H. Emery, Jr., who flew a two year old plane against the latest models into fifth place in the New York to Spokane Air Derby, began using KENDALL PENZBEST Motor Oil, he changed his oil after ten or twelve hours flying.

"Now," he says, "I never drain the oil until it has been used for over twenty hours." It is safe to assume that perfect lubrication is one of the reasons why his two year old Travel Air Plane reached Spokane in fifth place.

KENDALL PENZBEST Motor Oil holds up because it is refined from 100% Bradford Crude, the highest grade of Pennsylvania Crude, by a process that removes all the wax mechanically possible.

If you want to know what results other leading pilots are getting from KENDALL PENZBEST Motor Oil, send for our interesting booklet—*Ground Flying on the Subject of Lubrication.*

KENDALL PENZBEST MOTOR OILS
REG. No. 216831

KENDALL PENZBEST MOTOR OIL

KENDALL REFINING COMPANY
BRADFORD PA.

(Person.AIRlities continued)

PILOT E. G. "SWEDE" RHENSTROM, Sales Representative for Fairchild Aviation Corporation in their Southwestern Branch Territory, is emancipated from the Goofy Garment Era of Air Travel. Flying a Fairchild cabin plane in his business of selling airplanes and making aerial surveys in Texas, Oklahoma, Arkansas, and Louisiana, Swede is dressed like any other business man in a standard three-piece suit by the Four Marx Brothers. He wears a Stetson hat instead of a helmet.



Dick Pears

That is, I'm taking it for granted that he is dressed like that when he flies. And if he isn't, he should be. With the use of the enclosed plane, the need for trick air clothing disappears, giving the pilot the opportunity of demonstrating to the public the fact that one need not necessarily look peculiar in order to fly. This may seem like an unimportant point, and certainly it is not very important. But it's just another one of those things that brings home to passengers the thought that riding in a cabin plane is not radically different from riding in a sedan. At least, one may wear the same clothing in either vehicle. Of course, flying clothing always will be necessary in open-cockpit models; but the closed job offers an excellent opportunity of driving home the lesson that you don't even have to dress differently in order to fly in closed planes.

Lloyd M. Long is the manager of the Fairchild Branch in Dallas, while Pilot Dick Pears is forwarding the Fairchild cause in Chicago from his headquarters at 332 South Michigan Avenue. Dick says, "Can you picture a demure Mineola-ite suddenly deposited in this wicked, gun-toting big city?" He's like Eliza crossing the ice with the bloodhounds on her trail. Pray for him.

LAST month I kidded Speed Holman on those 1,433 loops he negotiated recently; I asked him how far the loops would have advanced aviation if they had been straightened out into a line. He comes right back at me: "If those loops were straightened out, they wouldn't reach very far, but as the Two Black Crows say, 'It would be a day's work for one airplane.' At least, they were all progressive, and as such, while they may not have advanced aviation, they surely did not retard it very far. Then, too, like the majority of our species, when I see a chance for publicity I become so modest—and push it away from me with a good strong rope. Publicity never hurt anyone unless it was because of murder. Have you considered how many miles are covered around a race-track, and they always have the horses, or what will you, stop at the same place they started? Likewise do we not hold our breaths and ride the roller-coaster?—only to disembark at the exact spot from which we started? You desired light on the subject—have you received it?"

Yes, Speed, I have. I'm all lit up like a Ku Klux Cross. And I have to admit that most of us run in circles most of the time. Our whole life, in fact, seems to me a rather meaningless circle. We emerge from Silence, rotate in our brief earthly orbit, and to Silence return. Some people believe that they have found a meaning in our collective antics, but I confess that I have found none. To me, Life and those loops of yours are about on a par. We start the loop at the cradle and finish it at the grave—and the undertaker puts the crate in the hangar.

LIEUT. ED McREYNOLDS is Government Representative at the Keystone Aircraft Corporation, Bristol, Pa., taking the place of Lieut. Frank Tyndall, who was married last February. Whenever an inspector gets married, the Army always moves him away from Bristol. They figure he's going to suffer enough, anyhow, without leaving him there. McReynolds gets away when he can, by ferrying the new Keystone bombers wherever they are wanted. But he always has to come back to Bristol. It's enough to drive a man to matrimony.

Stanley Jacques informs me that the Keystone Co. has erected a new hangar on their field at Bristol, hoping against hope that some pilot will land there and spend the night. But none of them ever do. They go right on to Philadelphia or New York. Even the trains don't hesitate at that burg—only the milk trains. The rest of them snort on by and stop at Trenton. Luke Christopher flew up from Langley the other day with Lieut. Davis. But did they stay the night in Bristol? They did not. They went right back to Langley. That just goes to show!



"Swede" Rhenstrom

LAST month I mentioned the famous J. Cloude Smith, jr., of Philadelphia, world-renowned Godunk who holds the same envied position in Godunking that One-eyed Connolly clings to in gate-crashing. His slogan is, "Never pay for a flight." Godunk Smith has flown free in almost every airplane in America and is now devoting his talents to lighter-than-air craft.



Dada and Godunk

Mr. Smith has been elected president of the Greater Godunks' Association of America which is waging a fight against pay-as-you-enter street-cars. "The pay-as-you-enter car," said Mr. Smith in an interview to-day, "is a direct infringement on American liberty. It takes all the sporting element out of riding."

Our fortunate photographer has caught Mr. Smith wearing the coon-skin flying outfit which he has purchased to enable him to horn in on Commander Byrd's flight to the South Pole. Mr. Smith is going to try to get aboard disguised as an Eskimo dog, or husky. He is taking barking lessons at Sam Sanders Airedale Farm. In his arms Mr. Smith is holding his son, Dada, who will follow in the glorious foot-steps of his famous father. "I expect," said Mr. Smith, as he slipped into an airplane while the pilot wasn't looking, "that Dada will be the first Godunk to fly around the world for nothing."

IRVING BECK, nationally-known goggle manufacturer, sends me a problem. "My wife has been urging me to learn to fly," he writes, "although her equal insistence on increasing my insurance makes me rather suspicious. What do you make of it?"

Reply by Dr. Caldwell: You hardly give me enough information on which I may base an opinion. Which do you think your wife would prefer—you or the insurance? While I realize that it is the custom of husbands generally to believe that their wives prefer them to anything else in the world, evidence is not lacking that this belief is sometimes erroneous. The late Mrs. Snyder, for example, was singularly free of any preference for Mr. Snyder; and it is a known fact that many women find their husbands completely devoid of charm. You might, I think, weigh yourself and your present earning power against the total of your insurance, and its earning power. In fact, it would be safe, matrimonially speaking, to delete yourself entirely from the consideration and fix your speculations on the money. How much do you bring in? How much would the insurance bring in? If you bring in more than the insurance, you may safely learn to fly. Still, do not overlook the fact that husbands grow monotonous, while money is always interesting. I believe that you would do well to spend much time in prayer.



To Pilots

who know that every cloud does NOT have a silver lining

Groundlings may talk about "a silver lining"—but just nose your bus into a cumulus cloud, and try to find the silver. More often than not you'll find a thick, *juicy* lining—and get thoroughly soaked for your trouble.

No one knows it better than the men who design Spalding's aviation equipment. For they've learned about clouds from the clouds themselves.

So when you buy a Spalding Summer Flying Suit, you get a suit that's really weather-wise—a suit that is light and comfortable, yet sheds water like a whirring prop—a suit that'll keep you as dry as your spark plugs.

There are several different models of the Spalding Wet-Weather, Summer flying suits. A very popular one at $15.00, made of duck-back waterproof cloth; overall style. Others at $20.00, and on up to the specially waterproofed wool gabardine suits at $40.00 and $45.00. All feature lightning fasteners down the front, and on both legs—enabling you to change easily and in a hurry.

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NEWS OF THE AIR SERVICES

ARMY AIR CORPS DEMONSTRATIONS

DEMONSTRATIONS of the striking force of pursuit and attack planes operating against infantry, artillery and cavalry under simulated war conditions are to be staged by the Army Air Corps during the month of May at the various Army service and tactical schools.

The first of these demonstrations will take place at the Army Air Corps Tactical School at Langley Field, Virginia, on May 4th, when Army aircraft will direct their fire against some 2,000 targets representing infantry and artillery and also engage in aerial combat. These demonstrations will be attended by members of the Senate and House Military Affairs Committee, high Government officials and other observers.

One of the outstanding features of the demonstrations will be the initial appearance in large scale army air operations of the new attack plane which is equipped with six machine guns and can carry 250 pounds of bombs in addition to 2,600 rounds of machine gun ammunition.

The demonstrations will be under the command of Brig.-Gen. Benjamin B. Foulois, Assistant Chief of the Air Corps. His staff will be headed by Major Carl Spatz, who will be in charge of operations. Following the demonstrations at Langley, similar exhibits will be given as follows:

May 5-8, Artillery School, Fort Bragg, M. C.; May 8-11, Infantry School, Fort Benning, Ga.; May 15-17, Artillery School, Fort Sill. Okla.; May 17-20, Cavalry School, Fort Riley, Kans.; May 20-23, General Service School, Fort Leavenworth, Kans.

AIRCRAFT IN NICARAGUA

THE most interesting feature of the activities of the U. S. Marines in Nicaragua is the wonderful results being obtained with, and the effectiveness of aircraft. Throughout the activities there, aircraft have been the most effective for all types of work, even including direct attack against ground troops. In fact in one of the recent engagements at Chipote, Vought "Corsair" planes, the latest, high-performance airplane equipment which had been rushed to Nicaragua, conducted the first independent and unsupported air attack ever made against a fortified position held by ground troops. The report from Nicaragua on this attack was as follows:

"In the Chipote fight Sandino had 1,500 men well armed and well led, dug in on an immense mountain over 3,000 feet high. They had plenty of machine guns and plenty of ammunition. General LeJeune saw the position and said that it would have taken a full regiment of troops to carry the position and they would have suffered heavy casualties in so doing. We had only four 'Corsairs' available when ordered to attack the position. We went after them with fragmentation and 50-pound demolition bombs, fixed and flexible guns, and finished up with infantry hand grenades. The first attack was planned as a preliminary affair, believing the strength of the enemy and small number of planes would require at least four attacks to finish the job. A swift approach was made from an unexpected direction, attacking in two columns without reconnoitering. The attack was met by a barrage of incendiary sky rockets. We came down with the front guns wide open and opened up with light bombs at about 600 feet. The rifle and machine gun fire was heavy and most of the planes stopped some bullets. The following ships came in with the heavier bombs. After the second dive, the enemy broke cover and there was a wild stampede. After that the party was wild and furious, and when we got through the place was badly messed up. On the following day the mountain was devoid of bandits. According to Sandino's own statement, his entire army deserted him except about 150 of his old reliables. It all sounds like a fantastic story, but is never-the-less true. This adds another to the many other exploits the 'Corsairs' have to their credit."

There were no casualties to the Marines in this attack, and the slight damage to the planes was quickly repaired. This report of actual operations emphatically proves the value of aircraft in warfare, particularly over difficult country.

In addition to use for attack purposes, the "Corsair" planes in Nicaragua have been in daily service for observation purposes, checking up on location of bandits, escorting ground troops in order to warn them of possible ambush, and for transport of all types of supplies to the troops scattered through the mountains, and to whom access by ground could only be made by many days of travel and use of pack mules, always subject to ambush.

A "Corsair" was also used by Lieut. Schilt in his recent heroic feat of rescuing eighteen wounded Marines from Quilali after an engagement with the rebels. This was done by making ten trips into a very rough field only 300 feet long and seventy feet wide. Lieut. Schilt has been awarded the Congressional Medal of Honor for this feat.

THE CURTISS MARINE TROPHY RACE

THE Curtiss Marine Trophy Race for high-speed seaplanes and flying boats, will be held at Washington, D. C. on Saturday, May 19, at 3 o'clock. The distance has been fixed at 100 miles, to be flown five laps around a 20 mile course on the Potomac River. Planes from the Naval Air Stations at Anacostia and Hampton Roads, Va., and from the Aircraft Squadrons Scouting Fleet, as well as from battleships and cruisers on the Atlantic Coast will participate.

BIDS FOR CONSTRUCTION OF DIRIGIBLES

DESIGNS for a rigid airship of approximately 6,000,000 cubic feet volume, and price for designs and bids for construction of one and of two rigid airships which would be built under these designs have been invited by the Department of the Navy. The bids will be opened on July 26.

The readvertisement for bids follows the application of the American Brown Boveri Electric Corporation, Camden, N. J., to be permitted to bid for the construction of one or both of the two projected navy dirigibles. Previously the Goodyear Zeppelin Company had won the naval design competition, but was not awarded the contract because appropriations were not available.

LIBERTY ENGINE SALE AT NORTH ISLAND

TWENTY-NINE Liberty engines and a number of Liberty engine parts will be sold at the Naval Air Station, North Island, San Diego, Calif., to the highest bidder.

All bids will be publicly opened at 10:00 a. m., May 15, 1928.

The material can be inspected at the Naval Air Station from 8:00 a. m. to 4:30 p. m. daily, except Saturday afternoons, Sundays and holidays, and copies of Sale Catalog No. 19 and bidding instructions will be furnished on request to the Office of the Supply Officer, U. S. Naval Air Station, San Diego, Calif.

NEW UNIFORM FOR ARMY FLYING CADETS

A NEW slate blue uniform for Army flying cadets has been approved. The uniform will consist of a roll collar tunic, trousers without cuffs, dress cap of overseas design, black kid shoes and black patent leather dress belt. A white shirt and black tie will be worn with the coat. For wear without the coat there will be issued a shirt of the same color as the uniform.

AIR CORPS BANDS

IN connection with the organization of Air Corps bands at Kelly Field, Texas; Chanute Field, Ill., and France Field, Panama Canal Zone, under authority of the five-year Air Corps expansion program, the War Department recently announced the designation of these three bands, as follows:

The band at Kelly Field will be known as the "Air Corps Training Center Band;" the one at Chanute Field as the "Air Corps Technical School Band;" and the one at France Field as the "6th Composite Group Band, Air Corps." These units may be administered, messed and supplied as provided for regimental bands.

THREE MILLION MILES

26,672 HOURS

OF

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The operating record for the Naval Air Service has been held by VOUGHT planes for many years, the 1927 record exceeding by 1,500 hours the former record made in 1926. With the large number of VOUGHT "CORSAIRS" now being delivered, another new record is also inevitable during 1928.

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ARMY AND NAVY AIR SERVICE ORDERS

ARMY AIR CORPS ORDERS

THE following Army Air Corps orders have been issued as of the dates indicated in brackets:

Aldrin, 1st Lt. Edwin B., promoted to rank of captain. (Mar. 24)

Barry, Maj. Archie W., order of Mar. 13 relieving him from duty at Scott Field, revoked. (Mar. 31)

Bennington, Lt. Col. Harold, Reserve, report for training to procurement planning representative, Chicago, Ill. (Apr. 8)

Bond, 1st Lt. Carlton F., order of Dec. 29 amended to Crissy Field, Presidio of San Francisco, Calif. (Apr. 2)

Brown, 1st Lt. Courtlandt M., Primary Flying School, Brooks Field. Tex., to Scott Field, Ill. (Apr. 12)

Caldwell, 2d Lt. Charles H., Mitchel Field, N. Y., to student Eng. School, Wright Field, Ohio. (Mar. 20)

Chisum, Maj. Jenner Y., procurement dist., San Francisco, Calif., to Wright Field, Ohio (Mar. 19)

Clowry, 1st Lt. James, Reserve, order of Mar. 29 revoked. (Apr. 12)

Cole, Capt. Ross F., student Inf. School, Fort Benning, Ga., to Tactical School, Langley Field, Va. (Apr. 5)

Collins, 2d Lt. James Henry, resignation of commission accepted. (Apr. 12)

Connell, Capt. Carl W., relieved from duty at Langley Field, Va., to Tactical School, same station. (Apr. 5)

Couch, 2d Lt. Howard H., student Balloon and Airship School, Scott Field, Ill., to report to commanding officer same station for duty. (Apr. 11)

Crawford, 2d Lt. Alden R., promoted to rank of first lieutenant. (Mar. 24)

Dawson, 2d Lt. Wallace Stribling, resignation of commission accepted. (Apr. 12)

DeFord, Capt. Earl H., Middletown air depot, Pa., to Tactical School, Langley Field, Va. (Apr. 5)

Dixon, Capt. Vincent B., Selfridge Field, Mich., to Tactical School, Langley Field, Va. (Apr. 5)

Ferson, Capt. Oliver S., Wright Field, Ohio, to Tactical School, Langley Field, Va. (Apr. 5)

Giles, 1st Lt. Barney McK., Wright Field, Ohio, to March Field, Calif. (Mar. 19)

Hall, Col. Chambers G., Army War College, to Chanute Field, Ill. (Mar. 20)

Hill, Vice Capt. Ralph E., C.A.C., relieved from duty involving flying for purpose of acting as observer, etc. (Apr. 18)

Hoag, 1st Lt. Earl S., Mitchel Field, N. Y., to Philippine Dept. (Apr. 13)

Hohley, Maj. Alfred H., procurement planning representative for Dayton, Ohio, to office of Asst. Secretary of War. (Apr. 8)

Holcomb, 2d Lt. Leslie P., promoted to rank of first lieutenant. (Apr. 18)

Horton, Maj. Harry Mack, Reserve, to Bolling Field, D. C. (Apr. 6)

Johnston, Capt. Douglas, student C. A. School, Fort Monroe, Va., to Tactical School, Langley Field Va. (Apr. 5)

Jouett, Maj. John H., office of Chief of Air Corps, to Fort Crockett, Tex. (Apr. 5)

Kane, 1st Lt. Clarence P., language officer, Tokyo, Japan, to Rockwell air depot, San Diego, Calif. (Apr. 5)

Lackland, Maj. Frank D., Fort Crockett, Tex., to Tactical School, Langley Field, Va. (Apr. 5)

Lanphier Maj. Thomas G., Selfridge Field, Mich., to Tactical School, Langley Field, Va. (Apr. 5)

Lowe, 2d Lt. Thomas M., promoted to rank of first lieutenant. (Mar 24)

Marriner, 1st Lt. Alfred M., Crissy Field, Calif., to 2d Div., Fort Sam Houston, Tex. (Mar. 22)

McCullough Capt. Roger S., relieved from duty at Langley Field, Va., to Tactical School, same station. (Apr. 5)

McDonnell, Maj. John C., Third Corps Area, to Office of Chief of Air Corps. (Mar. 20)

McDonnell, 1st Lt. John M., office of Chief of Air Corps, to student Advanced Flying School, Kelly Field, Tex. (Apr. 17)

Myers, 2d Lt. Charles T. jr., promoted to rank of first lieutenant. (Mar. 24)

Peck, Maj. Norman W., district procurement office, Akron, Ohio, to Tactical School, Langley Field, Va. (Apr. 5)

Rader, Maj. Ira A., student Comm. and Gen. Staff School, Fort Leavenworth, Kans., to inst. Inf. School, Fort Benning, Ga. (Mar. 30)

Robins, Maj. Augustine W., Fairfield air depot, Ohio, to Tactical School, Langley Field, Va. (Apr. 5)

Roth, 2d Lt. Arthur, C.A.C., duty involving flying for purpose of acting as observer, etc. (Apr. 18)

Rudolph, Maj. Jacob H., Wright Field, Ohio, to Tactical School, Langley Field, Va. (Apr. 5)

Schlatter, 2d Lt. David M., promoted to rank of first lieutenant. (Mar. 24)

Selff, 1st Lt. Robert E., appointed acting quartermaster in office of Chief of Air Corps. (Mar. 29)

Stenseth, 1st Lt. Martinue, student Cav. School, Fort Riley, Kans., to Selfridge Field, Mich. (Apr. 20)

Wolfe, 1st Lt. LeRoy M., Wright Field, Ohio, det. Org. Res. Fifth Corps Area, and assigned with 336th Service Sqdn. (Mar. 29)

Wooten, Ralph H., relieved from duty as quartermaster in office of Chief of Air Corps. (Mar. 29)

NAVY AIR SERVICE ORDERS

THE following Navy air orders have been issued as of the dates indicated in brackets:

Adair, Ens. Charles, det. *U. S. S. Mississippi;* to temp. duty Nav. Air Sta., Pensacola, Fla. (Apr. 18)

Alvis, Lt. John D., ors. Mar. 20, 1928 revoked; to continue duty Airc. Sqdns., Battle Flt. (Apr. 5)

Boaz, Ens. Richard M., det. *U. S. S. Texas;* to temp. duty Nav. Air Sta., Pensacola, Fla. (Mar. 30)

Bogan, Lt. Comdr. Gerald F., det. command V. F. Sqdn. 1B (*U. S. S. Langley*) Airc. Sqdns:. Battle Flt.; to Nav. Air Sta., Pensacola, Fla. (Mar. 21)

Bradley, Lt. (j.g.) Maurice M., det. *U. S. S. Humphreys;* to temp. duty Nav. Air Sta., Lakehurst, N. J. (Apr. 7)

Brandenburger, Lt. Harry A., det. V. O. Sqdn. 2B, (*U. S. S. New Mexico*), Airc. Sqdns., Battle Flt.; to Nav. Air Sta., San Diego. (Mar. 29)

Brill, Lt. Arthur T., det. *U. S. S. Lexington;* to continue treatment Nav. Hosp., Boston. (Mar. 21)

Bruton, Ens. Henry C., det. *U. S. S. California;* to temp. duty Nav. Air Sta., Pensacola, Fla. (Mar. 29)

Bushnell, Ens. Wilfred, det. *U. S. S. Lexington;* to temp. duty Nav. Air Sta., Lakehurst, N. J. (Mar. 23)

Campbell, Lt. (j.g.) William S., det. Nav. Air Sta., Pensacola, Fla.; to temp. duty Subm. Base, New London, Conn. (Mar. 29)

Carney, Lt. James V., det. V. F. Sqdn. 1B (*U. S. S. Langley*), Airc. Sqdns., Battle Flt.; to Nav. Air Sta., Pensacola, Fla. (Mar. 21)

Chapline, Lt. Comdr. George F., det. command V. F. Sqdn. 2B (*U. S. S. California*), Airc. Sqdns., Battle Flt.; to Bu. Aero. (Apr. 9)

Claiborne, Ens. Henri deB., det. Nav. Air Sta., Nav. Oper. Base, Hampton Rds., Va.; to Rec. Ship. N. Y., for temp. duty, thence to duty *U. S. S. Texas.* (Apr. 9)

Clark, Lt. Joseph J., det. V. O. Sqdn. 2B (*U. S. S. Pennsylvania*), Airc. Sqdns., Battle Flt.; to Nav. Air Sta., Anacostia, D. C. (Mar. 21)

Collins, Lt. Charles A., det. Nav. Air Sta., Pensacola, Fla.; to V. F. Sqdn. 1B, Airc. Sqdns., Battle Flt. (Apr. 8)

Cronin, Lt. Joseph C., det. V. J. Sqdn. 1B, Airc. Sqdns., Battle Flt.; to Nav. Air Sta., San Diego, Calif. (Mar. 27)

Davisson, Ens. Frederick A., det. *U. S. S. Maryland;* to temp. duty Nav. Air Sta., Pensacola, Fla. (Mar. 29)

Day, Lt. (j.g.) Douglas T., jr., det. *U. S. S. Hopkins;* to temp. duty Nav. Air Sta., Pensacola, Fla. (Apr. 16)

De Baun, Lt. George H., det. Nav. Air Sta., Anacostia, D. C.; to V. F. Sqdn. 6B, Airc. Sqdns., Battle Flt. (Apr. 9)

Doyle, Lt. Austin K., orders Mar. 17 modified to V. F. Sqdn. 6B, Airc. Sqdns., Battle Flt. (Mar. 29)

Dugan, Lt. (j.g.) Hammond J., det. *U. S. S. Humphreys;* to temp. duty Nav. Air Sta., Lakehurst, N. J. (Apr. 5)

Farrell, Lt. John G., det. Nav. Air Sta., Pensacola, Fla.; to V. O. Sqdn. 2b (*U. S. S. Pennsylvania*), Airc. Sqdns., Battle Flt. (Mar. 21)

Fick, Lt. Harold F., det. Nav. Air Sta., Pensacola, Fla.; to V. O. Sqdn. 2B, (*U. S. S. Tennessee*), Airc. Sqdns., Battle Flt. (Mar. 21)

Foster, Ens. John G., jr., det. *U. S. S. Mullany;* to temp. duty Nav. Air Sta., Pensacola, Fla. (Mar. 29)

Fuller, Ens. Wallace W., det. *U. S. S. Lexington;* to *U. S. S. Florida.* (Mar. 21)

Gillon, Lt. John F., det. V. T. Sqdn. 9S, Airc. Sqdns., Sctg. Flt.; to Nav. Air Sta., Pensacola, Fla. (Apr. 11)

Gotjen, Ens. John H., det. *U. S. S. Ramapo;* to temp. duty Nav. Air Sta., Pensacola, Fla. (Apr. 2)

Grant, Lt. Lucian M. (C.C.), det. Nav. Airc. Factory, Phila., Pa.; to temp. duty Nav. Air Sta., Pensacola, Fla. (Apr. 5)

Gregory, Lt. George R., det. Nav. Air Sta., Pensacola, Fla.; to V. O. Sqdn. 3S, (*U. S. S. Memphis*), Airc. Sqdns., Sctg. Flt. (Mar. 21)

Griffin, Lt. Virgil C., det. Head Air Dept., *U. S. S. Lexington;* to *U. S. S. Lexington.* (Apr. 3)

Hains, Ens. Hamilton, det. *U. S. S. California;* to temp. duty Nav. Air Sta., Pensacola, Fla. (Mar. 30)

Hawkins, Lt. Kenneth C., det. Nav. Air Sta., San Diego, Calif.; to V. O. Sqdn. 1B, Airc. Sqdns., Battle Flt. (Apr. 2)

Head, Lt. Clarence M., det. Nav. Air Sta., San Diego, Calif.; to V. T. Sqdn. 2B, Airc. Sqdns., Battle Flt. (Mar. 27)

Hickey, Lt. Robert F., det. V. F. Sqdn. 6B, Airc. Sqdns., Battle Flt.; to Nav. Air Sta., Pensacola, Fla. (Mar. 21)

Hollingsworth, Ens. William R. det *U. S. S. Lexington;* to temp. duty Nav. Air Sta., Pensacola, Fla. (Apr. 16)

Hudson, Lt. Roy C., det. Columbia University; to *U. S. S. Saratoga.* (Apr. 16)

Jennings, Lt. (j.g.) Howard L., det. V. F. Sqdn. 2B (*U. S. S. New Mexico*), Airc. Sqdns., Battle Flt. (Mar. 20)

Johnson, Lt. Jesse G., det. V. T. Sqdn. 9S, Airc. Sqdns., Sctg. Flt.; to Nav. Air Sta., Nav. Oper. Base, Hampton Rds., Va. (Mar. 29)

Jones, Ens. Carroll B., det. *U. S. S. Nitro;* to temp. duty Nav. Air Sta., Pensacola, Fla. (Apr. 2)

Kirtley, Lt. Charles A., det. Nav. Air Sta., Nav. Oper. Base, Hampton Rds., Va.; to *U. S. S. Mercy.* (Apr. 13)

Lee, Lt. Thomas B., to duty involving flying, Nav. Air Sta., Anacostia, D. C. (Apr. 16)

Lewis, Lt. (j.g.) Clarke H., det. V. F. Sqdn. 1B (*U. S. S. Langley*), Airc. Sqdns., Battle Flt.; to Nav. Air Sta., Pensacola, Fla. (Mar. 21)

Livdahl, Ens. Orlin L., det. *U. S. S. Melvin;* to temp. duty Nav. Air Sta., Pensacola, Fla. (Mar. 30)

Lowry, Lt. James D., jr., det. Nav. Air Sta., Pensacola, Fla.; to V. O. Sqdn. 3S (*U. S. S. Raleigh*), Airc Sqdns., Sctg. Flt. (Mar. 21)

MacComsey, Lt. (j.g.) Henry F., det. V. F. Sqdn. 6B, Airc. Sqdns., Battle Flt.; to Nav. Air Sta., Pensacola, Fla. (Mar. 21)

Mackerracher, Lt. (j.g.) Robert A., det. *U. S. S. Langley;* to temp. duty Subm. Base, New London, Conn. (Mar. 26)

Malstrom, Lt. (j.g.) Alvin I., det. V. O. Sqdn. 2B, (*U. S. S. Tennessee*), Airc. Sqdns., Battle Flt.; to Nav. Air Sta., Pensacola, Fla. (Mar. 20)

Marley, Lt. Albert S., jr., det. Nav. Air Sta., San Diego, Calif.; to V. O. Sqdn. 1B, Airc. Sqdns., Battle Flt. (Apr. 2)

May, Ens. Benjamin, 2nd, orders Feb. 17 and Mar. 12 revoked; det. *U. S. S. Sirius;* to temp. Duty Nav. Air Sta., Lakehurst, N. J. (Apr. 5)

McDade, Lt. William M., det. aide and flag lieut. on staff, Airc. Sqdns., Battle Flt.; to Nav. Air Sta., Pearl Harbor, T. H. (Mar. 30)

McNally, Ens. James A., det. Nav. Air Sta., Pensacola, Fla.; to Asiatic Sta. (Mar. 23)

Miller, Ens. William, jr., det. *U. S. S. Concord;* to temp. duty Nav. Air Sta., Pensacola, Fla. (Apr. 18)

Morehouse, Lt. (j.g.) Albert K., det. V. F. Sqdn. 1B (*U. S. S. Langley*), Airc. Sqdns. Battle Flt.; to Nav. Air Sta., Pensacola, Fla. (Mar. 21)

Mundorff, Ens. George T., det. *U. S. S. California;* to temp. duty Nav. Air Sta., Pensacola, Fla. (Mar. 30)

Norman, Ens. Robert G., det. Nav. Air Sta., Pensacola. Fla.; to *U. S. S. Vega.* (Mar. 30)

Oberholtzer, Ens. William E., jr., det. *U. S. S. Argonne;* to temp. duty Nav. Air Sta., Lakehurst, N. J. (Apr. 14)

Owen, Lt. George T., det. V. O. Sqdn. 3S (*U. S. S. Raleigh*), Airc. Sqdns., Sctg. Flt.; to V. O. Sqdn. 5S, Airc. Sqdns. Sctg. Flt. (Apr. 7)

Parr, Lt. (j.g.) Warren S., det. Rec. Ship, San Francisco; to temp. duty Nav. Air Sta., Pensacola, Fla. (Mar. 31)

Regan, Lt. (j.g.) Herbert E., det. V. F. Sqdn. 1B (*U. S. S. Langley*), Airc. Sqdns., Battle Flt.; to Nav. Air Sta., Pensacola, Fla. (Mar. 21)

Rule, Lt. Adrian O., jr., det. Nav. Air Sta., Pensacola, Fla.; to V. T. Sqdn. 1B, Airc. Sqdns., Battle Flt. (Mar. 21)

Russell, Ens. James S., det. *U. S. S. West Virginia;* to temp. duty Nav. Air Sta., Pensacola, Fla. (Apr. 18)

Saunders, Lt. (j.g.) William V., det. *U. S. S. Lawrence,* to temp. duty Nav. Air Sta., Pensacola, Fla. (Apr. 19)

Shane, Ens. George D., det. *U. S. S. Colorado;* to temp. duty Nav. Air Sta., Pensacola, Fla. (Mar. 30)

Shapiro. Ens. Israel D., det. *U. S. S. Lexington;* to temp. duty Nav. Air Sta., Lakehurst, N. J. (Mar. 23)

Sharpe, Lt. John, det. *U. S. S. Colorado,* to N. A. S., San Diego, Calif. (Apr. 3)

Signer, Ens. Charles E., det. *U. S. S. Colorado;* to temp. duty Nav. Air Sta., Pensacola, Fla. (Mar. 30)

Smoot, Ens. Otho P., jr., det. *U. S. S. Wright;* to temp. duty Nav. Air Sta., Pensacola, Fla. (Apr. 18)

Sprague, Lt. Thomas L., det. V. O. Sqdn. 1B (*U. S. S. Maryland*), Airc. Sqdns., Battle Flt.; to Nav. Air Sta., San Diego, Calif. (Mar. 27)

Stanley, Lt. Henry T., det. V. T. Sqdn. 2B, Airc. Sqdns., Battle Flt.; to Nav. Air Sta., San Diego, Calif. (Mar. 29)

Stirling, Ens. Yates, 3rd, det. *U. S. S. Bainbridge;* to temp. duty Nav. Air Sta., Pensacola, Fla. (Apr. 18)

Temple, Lt. (j.g.) Harry B., det. Rec. Ship, San Francisco; to temp. duty Nav. Air Sta., Pensacola, Fla. (Mar. 31)

Tullson, Ens. Waldo, det. *U. S. S. Cuyama;* to temp. duty Nav. Air Sta., Pensacola, Fla. (Apr. 9)

Ward, Ens. James H., det. *U. S. S. Sirius;* to temp. duty Nav. Air Sta., Pensacola, Fla. (Apr. 5)

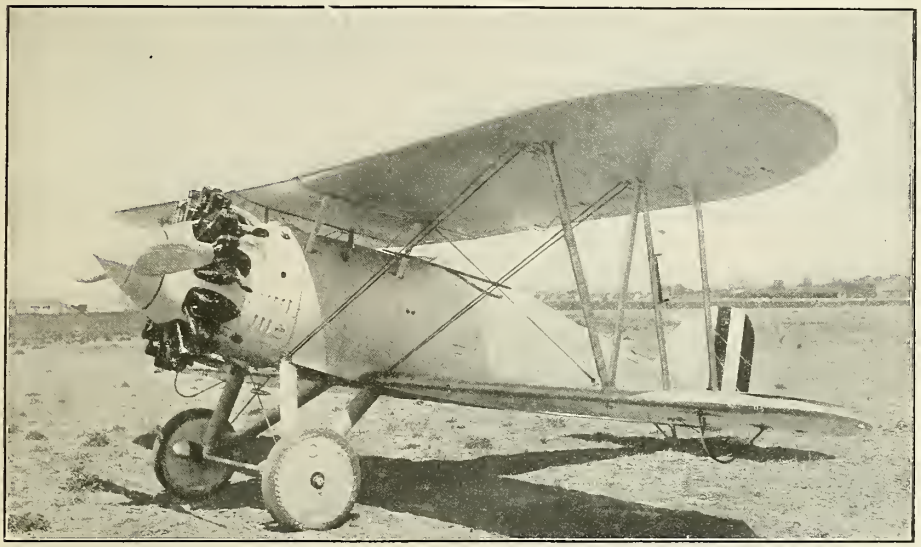
Watson, Ens. William A., det. *U. S. S. Arkansas;* to temp. duty Nav. Air Sta., Pensacola, Fla. (Apr. 16)

Webb, Lt. Leland D., det. V. F. Sqdn., 5S (*U. S. S. Lexington*), Airc. Sqdns., Battle Flt.; to *U. S. S. Lexington.* (Mar. 23)

Wolowsky, Lt. (j.g.) Joseph E., det. Nav. Air Sta., Pensacola, Fla.; to temp. duty Subm. Base, New London, Conn. (Mar. 29)

ANOTHER MANUFACTURER IN THE AVIATION INDUSTRY
THAT USES SKF BEARINGS AS STANDARD EQUIPMENT

THE PRATT & WHITNEY AIRCRAFT CO.



Bearing Reliability is Certain when the Highest Priced Bearing in the World is Used

MAN-MADE "wasps of the air" which must function under adverse conditions without ever a thought of failure! Such demands inevitably led to the choice of SKF Ball Bearings for the Pratt & Whitney Wasp motors on fighting planes.

From 800 to 1900 R. P. M. in four-fifths of a second! That is all it takes for the Wasp motor to accelerate and develop 425 H. P. Passing all Government acceptance tests also puts the stamp of approval on SKF Ball Bearings. The highest priced bearings in the world make no compromise with "good enough" where successful operation depends on the reliability of mechanical equipment.

You men who plan, build, use or pay for machines of any kind, remember this: It costs more to replace a poor bearing than to buy the best one that SKF ever produced. AND SKF ANTI-FRICTION BEARINGS ARE THE HIGHEST PRICED IN THE WORLD.

SKF INDUSTRIES, INCORPORATED, 40 East 34th Street, New York, N. Y. 1995

Ball Bearings - Roller Bearings

Nothing is apt to cost so much as a bearing that cost so little

SKF

LINDBERGH'S NEW RYAN BROUGHAM

By
W. A. Mankey
Chief Engineer,
B. F. Mahoney Aircraft Corporation

THE type B. I. Ryan Brougham airplane constructed for Colonel Lindbergh follows the standard Brougham practice with the addition of special features as will be mentioned in detail.

The fuselage is constructed entirely of steel tubing welded at all intersections. The luxuriously appointed cabin is the same size as the standard cabin. The pilot's seat as well as the passengers' seats are full couch upholstered and tufted in mohair. In the standard Brougham the seats are leather cushioned.



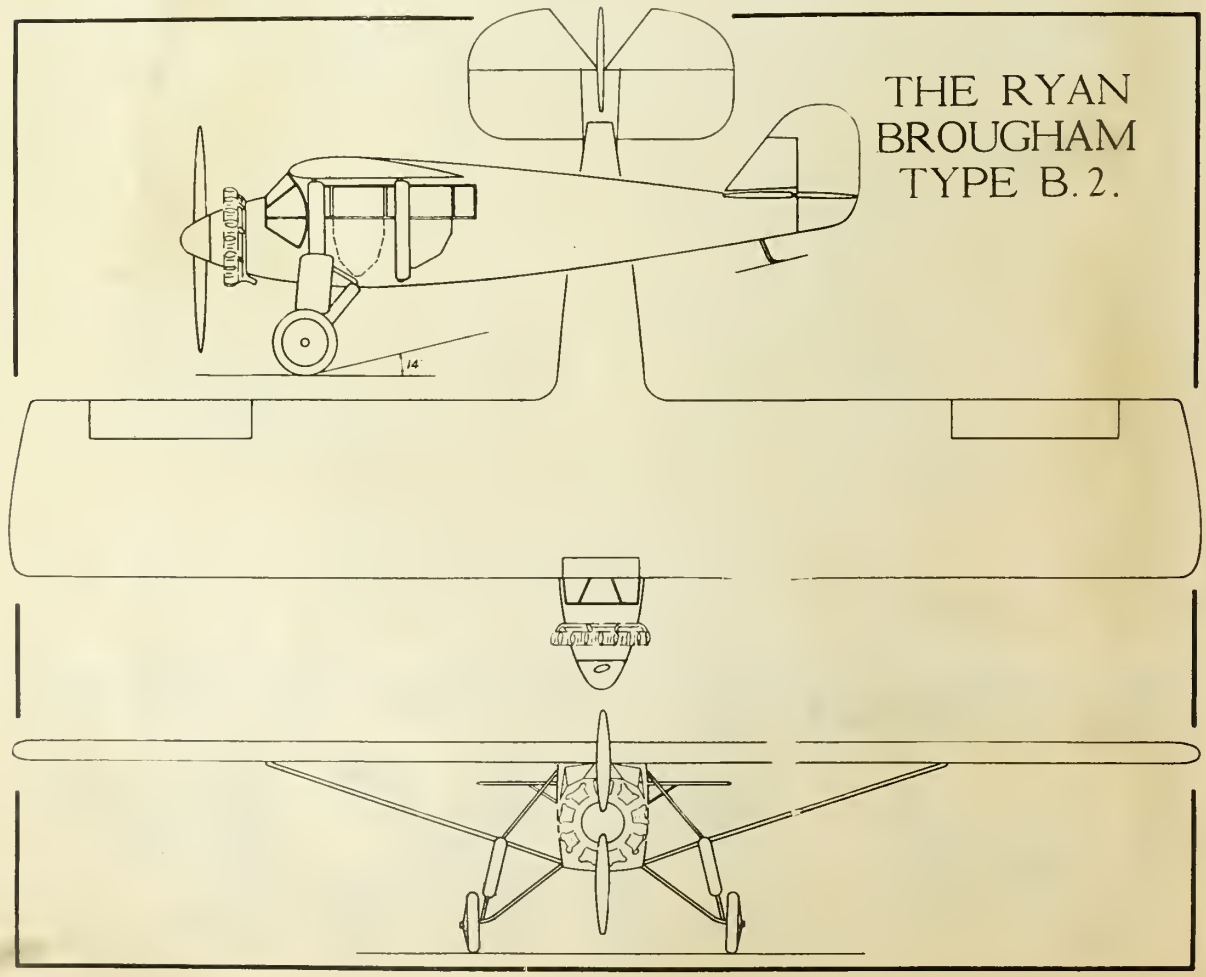
The same size wing is used as on *The Spirit of St. Louis*—a 46-foot span. The Clark "Y" wing section is employed. Ailerons are of enclosed type to reduce to a minimum the possibility of wing flutter. Tail surfaces have been increased in area, thus making for better stability and maneuverability. Wings are of conventional spruce construction, internally braced with wires and externally braced with streamlined lift struts. The tail surfaces and ailerons are of steel tubing. All surfaces are fabric covered.

The chassis is of standard split type construction with axles of heat treated chrome molybdenum steel tubing. The shock absorber units are the latest type Aerol struts which are approved by the Department of Commerce.

The shock absorbing unit of the tail skid consists of a series of rubber disks which resist in compression the load of the skid. The skid proper is fitted with a small wheel, thus making for quicker taxiing and turning and easier landing. The wheel is built up of laminations of leather and fibre with an Alemite connection for greasing the axle, the difference between the weight of the wheel skid and the ordinary shoe skid is negligible.

The power plant is the Wright Whirlwind J-5 engine with all exposed parts nickel-plated. The engine is equipped with an electric inertia starter which starts the engine at the pull of a switch. Electricity is furnished by a 12-volt battery which is charged from a generator mounted on and driven by the engine. The standard instruments are mounted on a specially finished mahogany instrument board.

Landing lights are provided and faired into the leading edge of the wing, while on the standard Brougham the landing lights are retraceable, (*Continued on page 768*)





Col. Charles A. Lindbergh's

new airplane is equipped with Goodyear Tires



GOODYEAR

Copyright 1928, by The Goodyear Tire & Rubber Co., Inc.

The Greatest Name in Rubber



DISTRIBUTORS

Massachusetts Airways Corporation, Springfield, Mass.
Capital Airways, Incorporated, Washington, D. C.
Mayer Aircraft Corporation, Bridgeville, Pa.
Buffalo Aircraft Distributors, Buffalo, N. Y.
Knapp Brothers Service, Ypsilanti, Michigan
Midwest Airways, Inc., Milwaukee, Wisconsin
Von Hoffman Aircraft Corporation, Anglum, Mo.
Midwest Airways Corporation, Monmouth, Illinois
C. S. Vassell, Minneapolis, Minn.
Stransky Airlines, Inc., Pukwana, So. Dakota
Southwest Ryan Airlines, Tulsa, Oklahoma
Mission Airplane Services, San Antonio, Texas
Mutual Aircraft Corporation, Los Angeles, California
Rankin Flying Service, Portland, Oregon
M. A. Zuniga, Central America

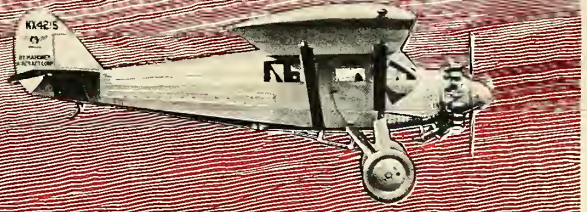
THE MAHONEY

Owners of Ryan Airlines and Ryan Flying Company • • • SAN DIEGO

Colonel LINDBERGH

chooses *another* MAHONEY PLANE

This time a Standard RYAN BROUGHAM



Our dealers continue to wire in for earlier deliveries—among them these:

"Sold first ship; also sold Bolte next one. Need demonstrator badly. What can you do?" *John Covington, Monmouth, Ill. April 4.*

"Congratulations on your wonderful ship. Came in Sunday after 2300 miles in better than 22 flying hours. Everything fine . . . both motor and ship performed beautifully. Good weather enabled passengers to enjoy every minute thoroughly and are eager to do it again. Ship sold this morning. Can you hurry up our next one? Best regards." *C. S. Yarnell, Minneapolis, April 3rd.*

* * *

The Mahoney Aircraft Corporation does not bask in the light of reflected glory. . . .

We urge our Distributors to make Competitive Demonstrations.

By comparison, we know that the *Ryan Brougham* will land slower, climb faster, fly higher, faster, further per pound horsepower than any cabin monoplane on the market. We are justly proud of the performance of this plane.

Our factory is *delivering* four Broughams per week. The present Brougham is without a doubt the finest plane in the history of this organization.

Purchasers who are looking for an airplane investment, distributors desiring a distinctly individual cabin plane of superior performance and outstanding reputation—will find the *Ryan Brougham* equal to their requirements.

The valuable Mahoney franchise is available only to operators and qualified business executives

U. S. Dept. of Commerce Approved Type Certificate No. 25

AIRCRAFT CORP'N

ST. LOUIS — *Owners of Ryan Airlines and Ryan Flying Company*



Front view of the Ryan Brougham which was especially fitted out for Colonel Lindbergh's personal use.

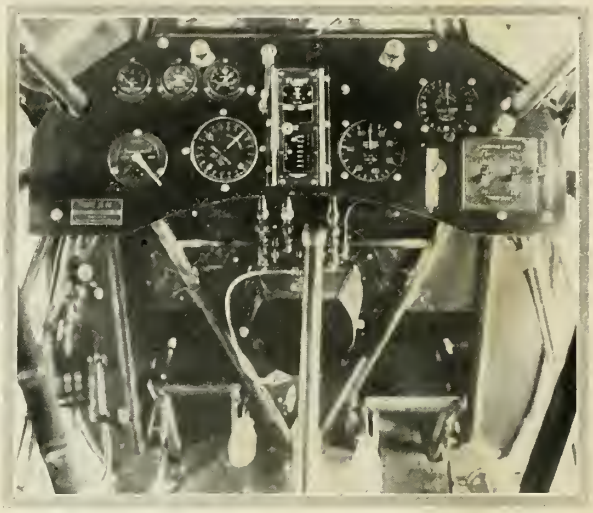
(*Continued from page 764*)

folding into the wing section.

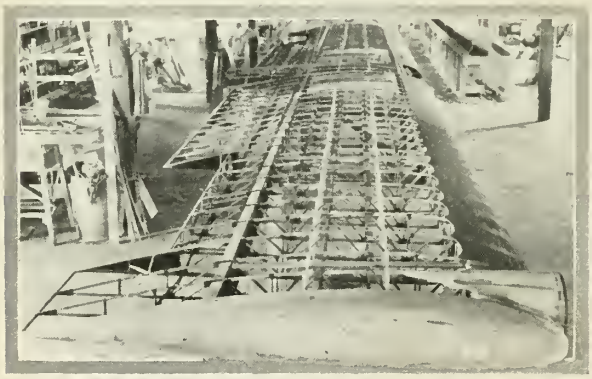
Standard parachute flares are mounted just aft of the passenger, so arranged as to drop by the release of a cable in the pilot's compartment. Tanks of a size sufficient for a flight of one thousand miles radius are mounted in the wing.

A summary of specifications and characteristics follow:

Span	46 feet
Overall length	27 feet 9 inches
Chord	7 feet
Tread of wheels	10 feet
Overall height	9 feet 10 inches
Weight empty	2000 pounds
Gross weight	3600 pounds
Useful load	1600 pounds
Pay load	1000 pounds
Power plant	Wright Whirlwind J-5-C
Gasoline capacity	120 gallons
Oil capacity	10 gallons



Cabin interior and instrument board of Lindbergh's plane.



The wing of Col. Lindbergh's plane during construction.

Areas

Wing area including ailerons	319 square feet
Rudder	11.5 square feet
Elevators	16½ square feet
Fin area	4 square feet
Stabilizer area	26 square feet
Stabilizer throw	9 degrees

Performances

Maximum speed	126 miles per hour
Landing speed	49 miles per hour
Service ceiling	17,000 feet
Climb with full load, still air, sea level, 900-1200 ft. per min.	
Take-off full load, still air, sea level, 500-600 feet (approx.)	

Lindbergh Tests His New Plane

OLD stuff, this demonstrating the stability of new planes by flying "hands off" and "feet off" and "motor off" but from San Diego comes a new one, this time it was introduced by Colonel Lindbergh himself.



Side view of Lindbergh's new Ryan Brougham.

The day he took delivery of his new plane and after a preliminary test flight with Don Hall, designer of the *Spirit of St. Louis,* Lindbergh went over to J. J. Herrigan, test

(*Cont. on next page*)

UPHOLSTERED IN
THE PRE-EMINENT MOHAIR VELVET

CHASE
Velmo



The cabin seat upholstery of Colonel Lindbergh's newest monoplane is Chase Velmo, the Perfected Mohair Velvet.

IN line with their selection of only the finest materials for the construction of Colonel Charles A. Lindbergh's new plane, the B. F. Mahoney Aircraft Corporation used genuine Chase VELMO Mohair Velvet for the upholstery. Thus they assure the occupants the utmost in luxurious riding comfort, and likewise protect themselves against the troubles an inferior upholstery fabric can cause.

Chase VELMO made by SANFORD MILLS, SANFORD, MAINE.
Selling Agents, L. C. CHASE & CO., Boston, New York, San Francisco, Chicago

(Continued from preceding page)

pilot for the Mahoney Company, and the two conversed in low tones for several minutes. Then with a broad smile on his lips, Lindbergh invited chief engineer, W. A. Mankey, and B. F. Mahoney to take a hop with him in his new plane. Hardly were the wheels off the runway when he headed for the low hills which comprise San Diego's back country, at a maximum altitude of fifty feet he throttled back the motor and turned around in his seat.

Hands and feet off the controls he began making low turns by opening and closing the right hand door of the Brougham. He motioned Mankey to open and close the left hand door, the plane turned in the other direction. By utilizing throttle and stabilizer he began to zoom and dive, occasionally turning by opening and closing the door.

Mahoney and Mankey showed their uneasiness so Lindbergh headed back for the field and made a perfect landing. A moment later Lindbergh said to Mankey, "It's just right, I like it."



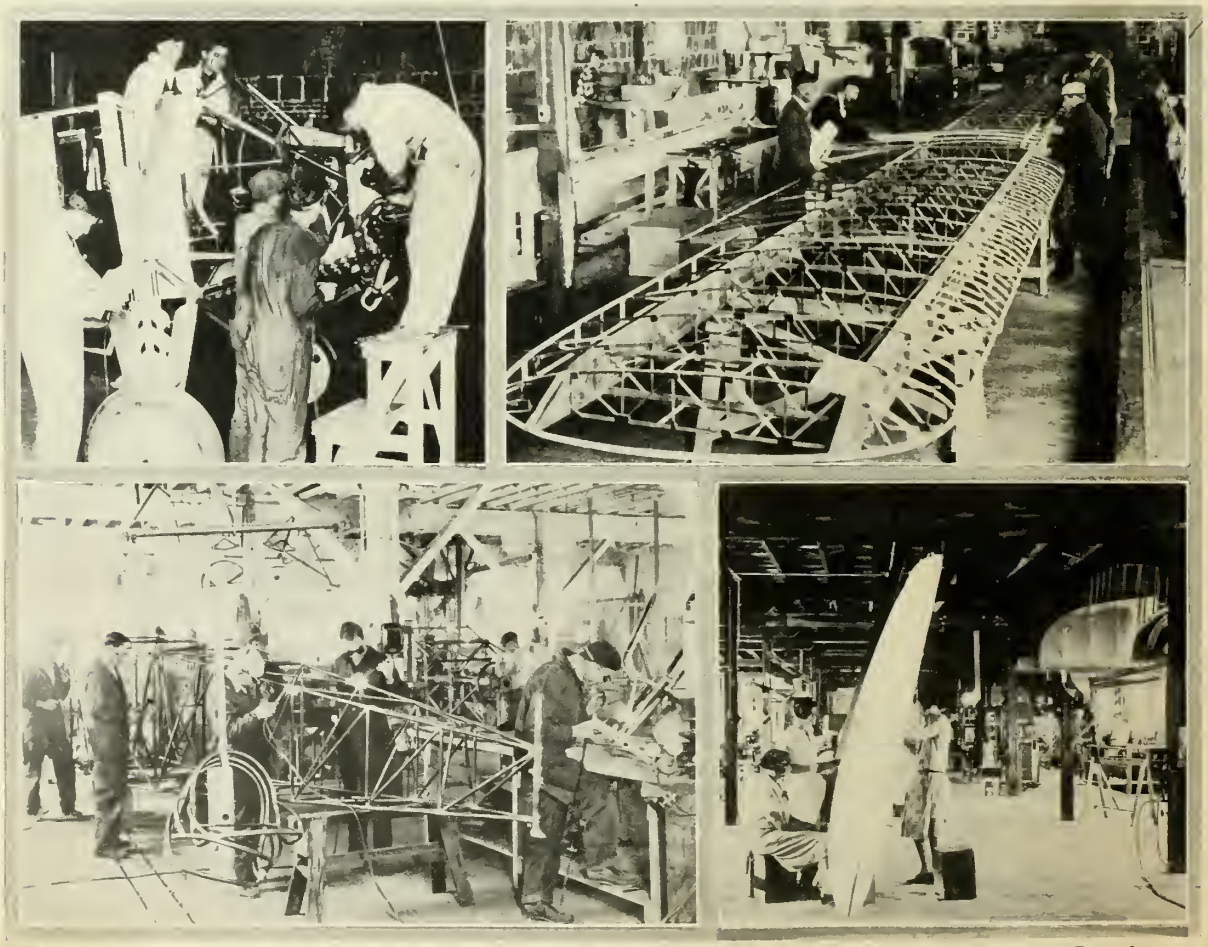
"A Brougham a Day"

"FULL PRODUCTION WEEK," so named to ascertain the capacity of the San Diego factory of the Mahoney Aircraft Corporation, proved that this plant could turn out a Brougham a day without increasing the size of the present building or adding to the present number of employees.

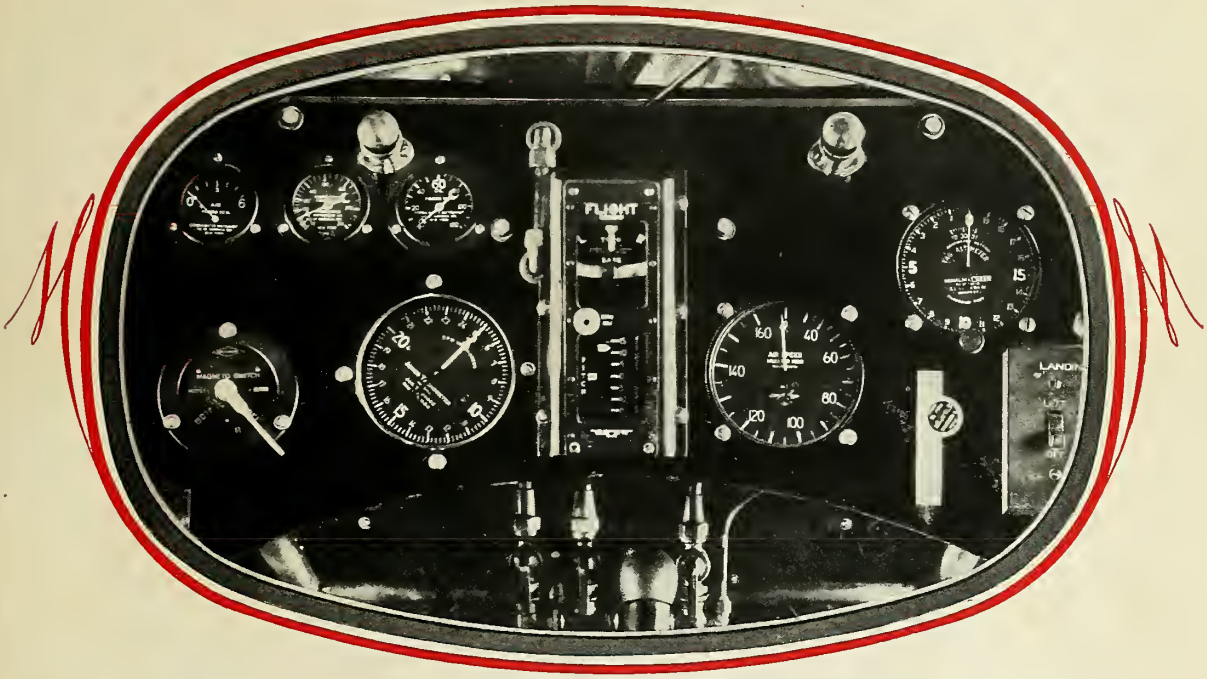
During the week of April 16th to 21st, the men were supplied with all the material they could use, the special line system of assembly was installed and six Broughams were assembled and test flown in the five and one-half day period.

By Monday evening, April 23rd, the entire lot had been delivered to respective purchasers.

"The only thing that prevents plane a day production on the Brougham is lack of motors," said John C. Nulsen, general manager of the Mahoney company.



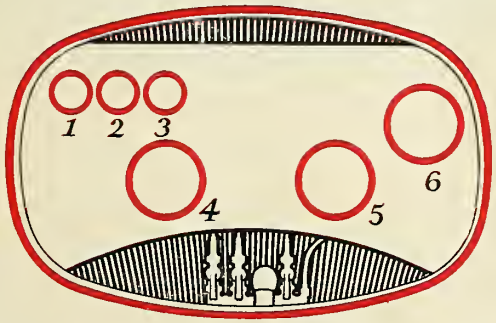
Some of the manufacturing and assembly departments of the Mahoney Company engaged in turning out Ryan Broughams.



Six Consolidated Instruments

On Lindbergh's New Ryan Brougham

1. Air pressure gauge
2. Temperature gauge
3. Oil pressure gauge



4. Tachometer
5. Air speed indicator
6. Altimeter

THE reproduction above is from an actual photograph of the instrument board of Colonel Charles Lindbergh's new Ryan Brougham. With the accompanying explanatory diagram it shows the exact position of each of the *six* Consolidated Instruments with which Lindbergh's new ship — like *all* Ryan airplanes — is equipped.

Consolidated dash lights and navigation lights are also employed on this flashing successor to the world-famed "Spirit of St. Louis."

One or more Consolidated Instruments is standard equipment on most American commercial airplanes — an eloquent tribute to the dependability of our products.

CONSOLIDATED

INSTRUMENT COMPANY OF AMERICA, INC.

41 East 42nd Street, New York

Western Representative—M. E. HULSE, 5391 Broadway, Oakland, Calif.

Altimeters, Tachometers, Oil Pressure Gauges, Gasoline Gauges, Thermometers, Air Speed Indicators, Compasses, Navigation Lights, Landing Lights, Dash Lights, etc.

PROGRESS since LINDBERGH'S FLIGHT

THE influence on aviation of Colonel Charles A. Lindbergh's great flight from New York to Paris a year ago is incalculable. Only by the signs that have appeared on the surface up to this time can we gauge the total effect. The world was so completely aroused by his flight and by the others that followed that it is doubtful whether the full effects can ever be traced.

Prior to Lindbergh's flight the percentage of people who really appreciated the potentialities of aircraft was comparatively small. Consequently growth was slow.

Then almost over night the world became air-minded. The barriers of disbelief, the bugaboo of fear, the too skeptical attitude of capital which had retarded industrial growth of aviation for years were suddenly swept aside. One magnificent flight had accomplished in 33½ hours what hundreds of men had been trying to do for years.

The aircraft industry then faced a production situation comparable to the sudden demand for "airplanes—more airplanes" back in 1917.

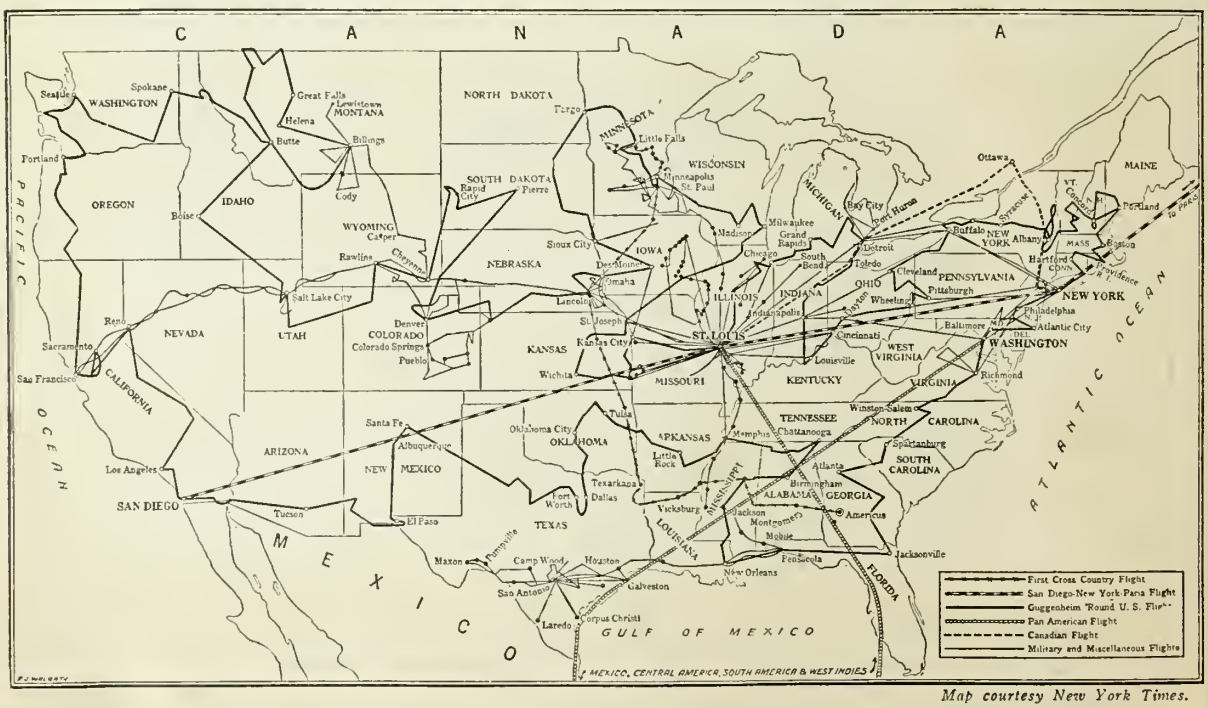


B. F. Mahoney and Col. Charles A. Lindbergh.

In 1925, there were 711 airplanes built for both military and commercial purposes. In 1926 the total was 1179—a gain of 65 per cent. Of the 1926 total but 954 were newly built and only 808 were for commercial use. During 1927 there were 2011 commercial airplanes built—an increase of 148 per cent over 1926.

In 1926 there were 67 aircraft and engine builders, in 1927 there were 124. An increase of almost 80 per cent in new builders.

All available forms of commercial air service felt the value of public recognition before the year was out. Air mail poundage had increased by the close of the year by 200 to 300 per cent. There were 538 commercial and municipal airports in operation or under construction. There were 383 new proposed fields. Air mail lines were extended some 3000 miles. By June, 1928, it is estimated that air mail planes will be flying 25,000 miles per day. The forecast by the Department of Commerce on aircraft production for 1928 is 75 per cent increase. This figure is undoubtedly conservative.



Map courtesy New York Times.

Redrawn from Colonel Lindbergh's original map on which he has recorded every flight he has made in the United States.



All *Air Endurance Records* are broken again with AC *Spark Plugs*

EDDIE Stinson and George Haldeman, in their Stinson-Detroit plane, powered by a Wright Whirlwind engine, shattered all existing time records for continuous flight on Friday, March 30.

By this performance, for the second time within a year, the world's high mark for continuous flight was broken with AC Spark Plugs.

Take the whole record of outstanding endurance flights made in the last year—it is a record of continuous success for AC.

Lindbergh, Byrd, Acosta, Chamberlin, Maitland, Hegenberger, Myers, Schlee and Brock—all performed gallantly in conquest of the air, all are consistent users of AC Spark Plugs.

No matter what engine you use, your air route is made safer and surer by using the recommended type of AC Spark Plugs. Dealers everywhere are glad to supply these spark plugs because AC products are *proved by every test standard of the world.*

Took off at 7:36 Wednesday morning, March 28. Landed at 1:12 Friday afternoon, March 30. Time aloft, (official) 53 hours, 36 minutes, 30 seconds.

AC-SPHINX
Birmingham
ENGLAND

AC Spark Plug Company
FLINT, *Michigan*

AC-TITAN
Clichy (Seine)
FRANCE

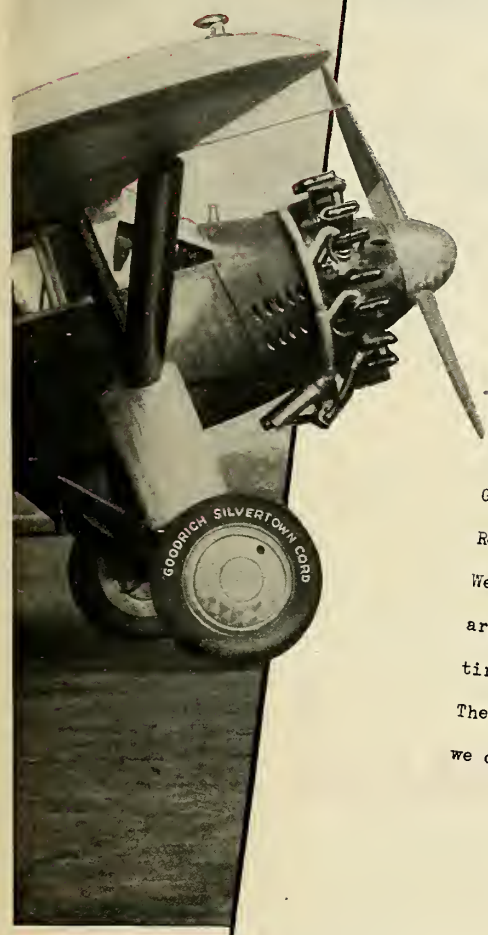
© 1928, AC Spark Plug Co.

AC SPARK PLUGS · AC SPEEDOMETERS · AC AIR CLEANERS · AC OIL FILTERS · AC FUEL PUMPS
AC GASOLINE STRAINERS · AC AMMETERS · AC OIL GAUGES · AC THERMO GAUGES



U. S. Department of Commerce Plane, Goodrich equipped. Built by the B. F. Mahoney Aircraft Corporation, San Diego, California.

Goodrich



B. F. MAHONEY AIRCRAFT CORP.
SAN DIEGO, CALIFORNIA

April
5
1928

B. F. Goodrich Rubber Company,
Akron, Ohio.

Gentlemen:

Re: Your telegram of April 3rd, 1928.

We wish to advise that our planes are equipped with Goodrich Silvertown Cord tires.

These have been entirely satisfactory, and we do not contemplate using any other.

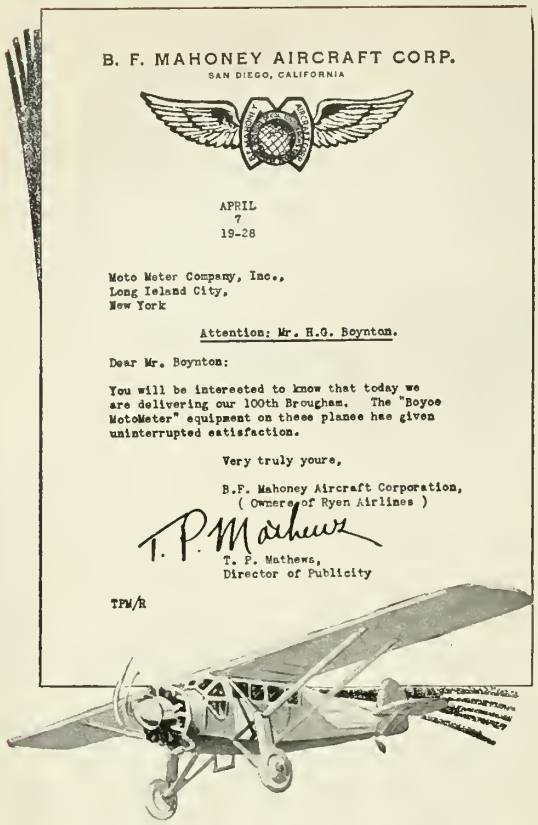
Very truly yours,

B. F. Mahoney

BFM:IR

BUILDER OF COLONEL LINDBERGH'S SPIRIT OF ST. LOUIS

Rubber *for Airplanes*



B. F. MAHONEY AIRCRAFT CORP.
SAN DIEGO, CALIFORNIA

APRIL
7
19-28

Moto Meter Company, Inc.,
Long Island City,
New York

Attention: Mr. H.G. Boynton.

Dear Mr. Boynton:

You will be interested to know that today we are delivering our 100th Brougham. The "Boyce MotoMeter" equipment on these planes has given uninterrupted satisfaction.

Very truly yours,

B.F. Mahoney Aircraft Corporation,
(Owners of Ryan Airlines)

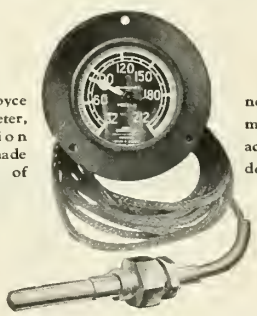
T. P. Mathews,
Director of Publicity

TPM/R

Gives "Uninterrupted Satisfaction" on Ryan Planes

And Mr. Mathews' letter of April 7, as shown above, naturally gives a great deal of satisfaction also. Yet, to paraphrase a well-known slogan, we can say no more than "A good 'plane deserves good instruments."

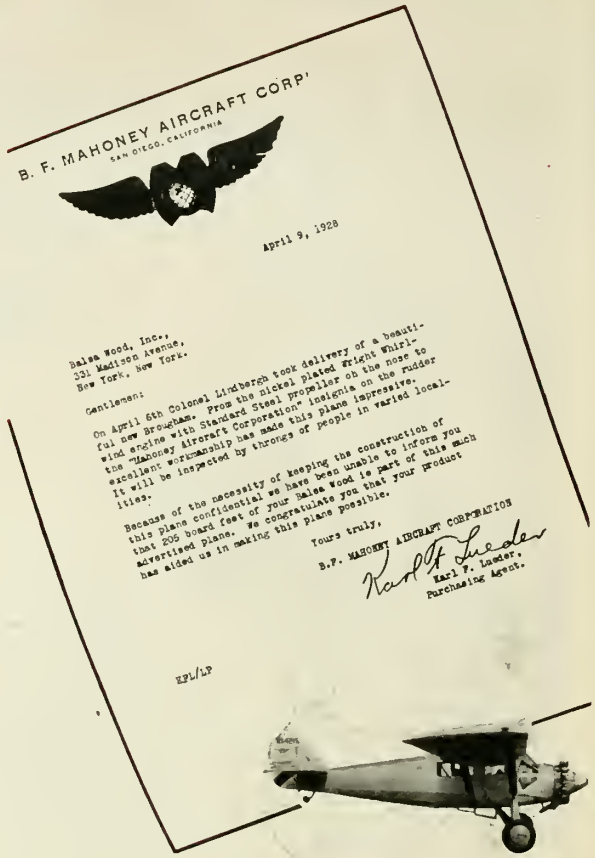
THE MOTOMETER COMPANY, INC.
1 Wilbur Ave., Long Island City, N. Y.
The MotoMeter Co. of Canada, Ltd., Hamilton, Ont.



The Boyce MotoMeter, Aviation Type, made entirely of non-ferrous materials; accurate and dependable.

BOYCE MOTOMETER

TRADE MARK REG. U. S. PAT. OFFICE



B. F. MAHONEY AIRCRAFT CORP.
SAN DIEGO, CALIFORNIA

April 9, 1928

Balsa Wood, Inc.,
331 Madison Avenue,
New York, New York.

Gentlemen:

On April 6th Colonel Lindbergh took delivery of a beautiful new Brougham. From the nickel plated Wright Whirlwind engine with Standard Steel propeller on the nose to the "Mahoney Aircraft Corporation" insignia on the rudder excellency workmanship has made this plane impressive. It will be inspected by throngs of people in varied localities.

Because of the necessity of keeping the construction of this plane confidential we have been unable to inform you that 205 board feet of your balsa wood is part of this much advertised plane. We congratulate you that your product has aided us in making this plane possible.

Yours truly,

B.F. MAHONEY AIRCRAFT CORPORATION
Karl F. Lueder,
Purchasing Agent.

KFL/LP

LATA BALSA WOOD

Mahoney also says, "Without materially increasing the weight of the plane we have increased the speed from 5 to 8 miles per hour by streamlining the wing struts, the shock absorber unit and landing carriage with Lata Balsa Wood in the shape of a perfect airfoil."

Lata Balsa is also used for insulation against temperature, vibration and shock.

To eliminate vibration of instruments, mount them on Lata Balsa.

Full details will be sent on request.

THE BALSA WOOD CO., Inc.
331 Madison Avenue New York, N. Y.

LATA
BALSA
WOOD
"LIGHT AS THE AIR"
TRADE MARK

PIONEER *Instruments* on the RYAN BROUGHAM

B. F. MAHONEY AIRCRAFT CORP.
SAN DIEGO, CALIFORNIA

April
Thirteenth,
1928.

Mr. Chas. H. Colvin,
Pioneer Instrument Company,
754 Lexington Ave.,
Brooklyn, N. Y.

Dear Mr. Colvin:

Under our new production schedule the Mahoney Aircraft Corporation is now delivering four BROUGHAMS per week.

Without a doubt they are the finest planes in the history of this organization and we are pleased to state that Pioneer instruments are playing an increasingly important part in their production.

Pioneer instruments have been an integral part of our equipment since the building of the original Ryan.

Very truly yours,

The MAHONEY AIRCRAFT CORP'N.
(Owners of Ryan Airlines)

S. C. Breder, Sales manager.

SCB/tpm.

Pioneer Instruments are used by leading aircraft manufacturers.

PIONEER INSTRUMENT COMPANY
754 LEXINGTON AVE. BROOKLYN NEW YORK

The
PIONEER LINE

Check the items in which you are interested, tear out the list, mail it to us, and we will send descriptive folders.

- Air Distance Recorder ☐
- Air Speed Indicator ☐
- Altimeter ☐
- Batteries ☐
- Climb Indicator ☐
- Compass, Magnetic ☐
- Earth Inductor Compass ☐
- Engine Gauge Unit ☐
- Flares ☐
- Flight Indicator ☐
- Fuel Level Gauge ☐
- Fuel Pressure Gauge ☐
- Fuel Strainer ☐
- Hand Fuel Pump ☐
- Holt Flares ☐
- Lamps, Instrument ☐
- Landing Lights ☐
- Navigation Lights ☐
- Octant ☐
- Oil Pressure Gauge ☐
- Power Fuel Pump ☐
- Refueling Pump ☐
- Sextant ☐
- Speed and Drift Meter ☐
- Tachometer ☐
- Tachometer Shaft ☐
- Thermometer ☐
- Turn Indicator ☐
- Watch ☐
- Wiley Flares ☐

639 SO. SAN PEDRO, LOS ANGELES - 15 SPEAR ST., SAN FRANCISCO - 97 BOULEVARD ST. MICHEL, PARIS STERNPLATZ 4, JOHANNISTHAL - BERLIN
45 JARVIS ST., TORONTO - - *General European Representative* - - M. CALDERARA - - 11 BIS RUE MONTAIGNE - - PARIS - - FRANCE

Lindbergh again uses

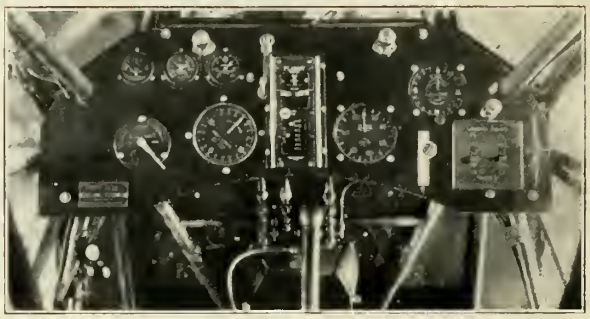
HASKELITE

HASKELITE, the blood albumen glue plywood, was in the "Spirit of St. Louis." It is in the Ryan Brougham No. 69—Lindbergh's new plane.

It has shared in practically all the record-breaking flights of recent years.

Leading builders everywhere choose HASKELITE for a variety of applications. Over 90% of the plywood used in the industry is of our manufacture.

Interesting blue print booklet on request.



Haskelite Manufacturing Corporation
120 S. La Salle Street
Chicago, Illinois

PLYWOOD
HASKELITE
PLYMETL

ADS Grey.

THE NBF CO.

SECURITY

American Lock Washers used exclusively on



Colonel Lindbergh's New Ryan

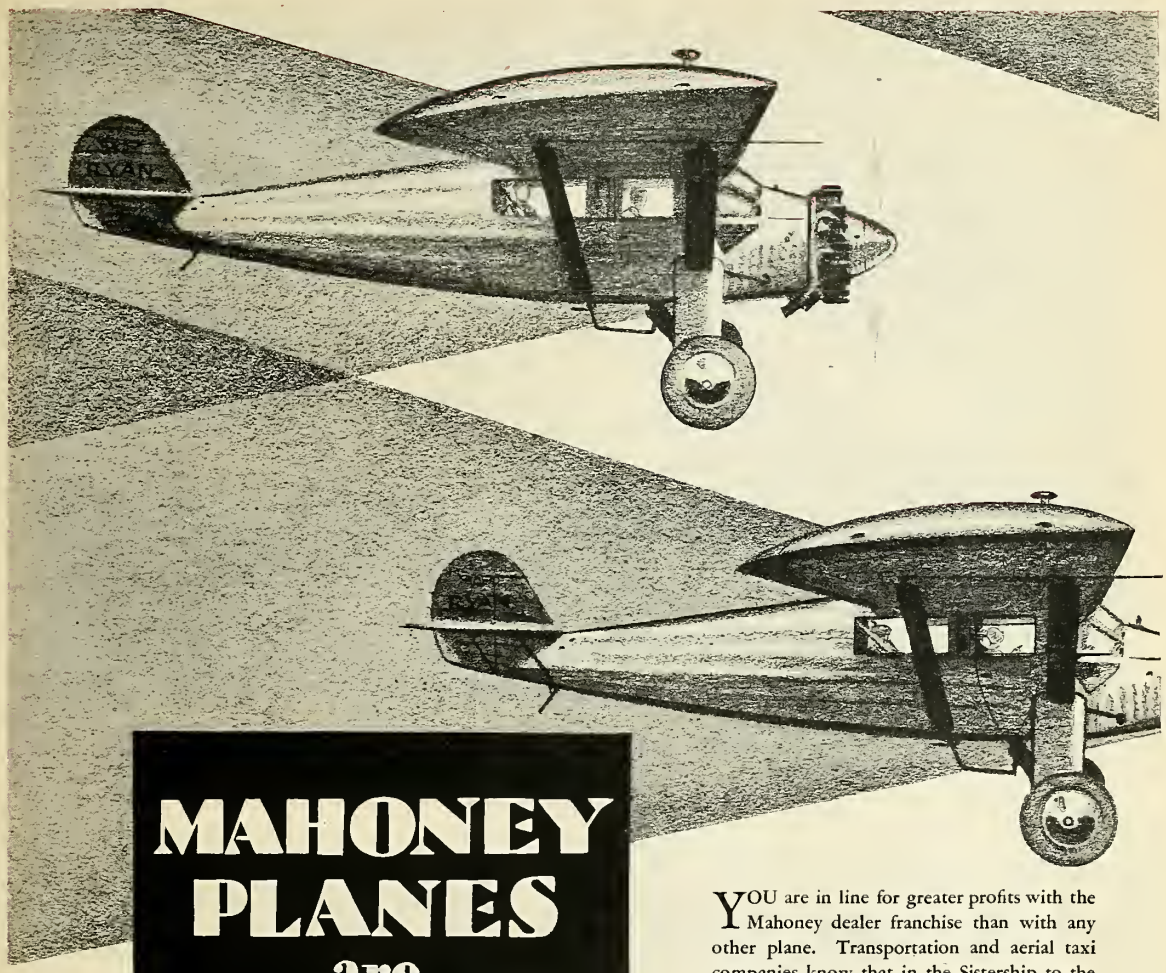
QUALITY

American Lock Washers used exclusively on

"SPIRIT OF ST. LOUIS" · ALL RYAN PLANES

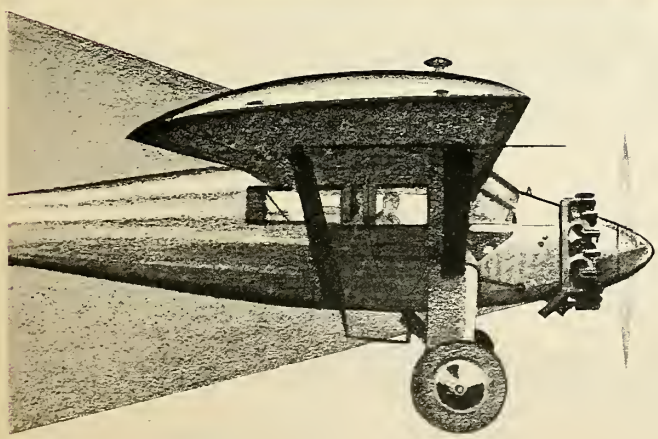
AMERICAN NUT & BOLT FASTENER CO.

Pittsburgh -:- **Pennsylvania**



MAHONEY PLANES are Money Makers

SISTERSHIPS TO THE SPIRIT OF ST. LOUIS



YOU are in line for greater profits with the Mahoney dealer franchise than with any other plane. Transportation and aerial taxi companies know that in the Sistership to the *"Spirit of St. Louis"*...

THE MOST ADVERTISED PLANE IN THE WORLD

...they have a *great drawing card,* a plane that has the admiration and confidence of everybody! Corporations are more and more active in the acquisition of this type of plane for their executives. Sportsmen and individuals of wealth find it ideal for week-end trips and long distance hops across the country. There's *a great market* for the Ryan Brougham!

Dealer franchises will be increasingly difficult to obtain. Send your application today for the territory you desire, and it will receive immediate attention.

MUTUAL AIRCRAFT CORPORATION
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Western Distributors for Mahoney Aircraft Corporation

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Municipal Airport on Greeley St., Portland, Ore.

CAPITAL AIRWAYS, Inc.

Distributors for

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The new Ryan Brougham, sister ship of the "Spirit of St. Louis," may now be seen in daily operation at

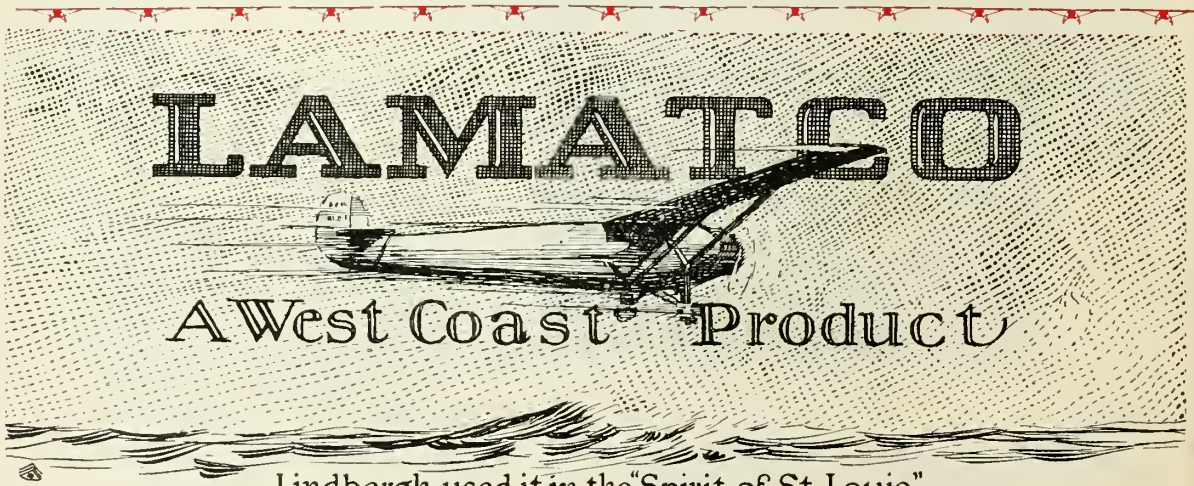
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These progressive corporations have chosen the Ryan Brougham because of its outstanding qualities. Reliability-Maneuverability-Sturdiness-Speed-Economical Operation.

Every Brougham owner is an enthusiastic booster.

Every one of their many passengers receives a demonstration of quick, easy take-off, perfect control, and graceful landing.

5315 Colorado Avenue, N. W. **Washington, D. C.**



Lindbergh used it in the "Spirit of St. Louis"
also in his new plane "Brougham, No. 69"

Three Ply Cottonwood-waterproof. Very reasonable in price. Thicknesses 1/8", 3/16", 1/4". We supply large quantities of "LAMATCO" to the B.F. Mahoney Aircraft Corporation. We carry large stocks ready for immediate shipment. Write or Wire us.

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HARDWOOD HEADQUARTERS *Since 1872*

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WISCONSIN DISTRIBUTORS

of the

RYAN BROUGHAM

Sister Ship of Colonel Lindbergh's "Spirit of St. Louis"

DEALERS WANTED—SOME CHOICE TERRITORY STILL OPEN—WRITE US.

SPEED — PERFORMANCE — DEPENDABILITY
COMFORT — ECONOMY

Local Dealers of EAGLEROCK Airplanes

MIDWEST AIRWAYS, Inc.

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We maintain a High Grade Flying School.
Also Inter-state passenger service and pleasure rides.

THE "SPIRIT OF ST. LOUIS"

and now

COL. LINDBERGH'S NEW BROUGHAM No. 69

are equipped with

SCINTILLA

AIRCRAFT MAGNETOS

During the past year fourteen major record flights were made by American airplanes using Scintilla Aircraft Magnetos.

Write for descriptive booklet.

SCINTILLA MAGNETO CO., Inc.

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Contractors to the U. S. Army and Navy

Roebling

CONTROL CABLES and BRACING WIRES

are used on the new brougham No. 69 just completed for Colonel Lindbergh by the B. F. Mahoney Aircraft Corporation.

Roebling Wire Aircraft Products also proved their dependability on the famous "Spirit of St. Louis."

JOHN A. ROEBLING'S SONS COMPANY
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AIRCRAFT CORD



TO AMERICAN AVIATION
STANDARD OIL COMPANY OF CALIFORNIA DEDICATES THESE LIGHTS

Visible from dusk to dawn to the flyer for a distance of a hundred to a hundred and fifty miles, these 10,000,000 candle-power lights—Standard Diablo (SD) on Mt. Diablo, and Standard-Los Angeles (SL) in the Merced Hills—have been established by the Standard Oil Company of California, at the suggestion of the United States Department of Commerce, that the aviator flying through the night may find friendly guidance, security, welcome, in the service he performs for the public.

Red Crown Aviation Gasoline made by the Standard Oil Company of California has been Colonel Lindbergh's motor fuel selection repeatedly. Across the Atlantic—the great Latin American tour—first for his Ryan, "The Spirit of St. Louis"—again first choice for his new Ryan cabin monoplane! This internationally famous motor fuel has also been honored in other great American Aviation achievements—the transoceanic flights of Commander Byrd, Maitland, Jenson and Smith as well as in its extensive use on transcontinental air mail routes and by Pacific Coast Aviation.

use AIR MAIL

GRUSS AERO STRUT



Close up view, showing installation of GRUSS AERO STRUT Shock Absorbers on a standard Mahoney Brougham.

Shock Absorbers

Are Standard Equipment on Mahoney Airplanes

THE B. F. Mahoney Aircraft Corporation, designers and builders of Colonel Lindbergh's "Spirit of St. Louis," now equip their standard ships with Gruss Aero Strut Shock Absorbers. They recognize in them the principle of operation that makes landings soft and short and insures protection to all parts of the ship.

SAFETY, Economy and Efficiency are the factors which determine the acceptance by aircraft manufacturers of any shock absorber. All three are "built-in" qualities of the Gruss Aero Strut—guaranteed by a ten inch compressed air cushioned range of deflection which provides a positive hydraulic check, controlling all recoil and landing jars.

"Always in the AIR, yet on the GROUND"

GRUSS AIR SPRING COMPANY OF AMERICA

San Francisco California

Approved by Department of Commerce



Lindbergh—Mahoney—Mobiloil!



The "Spirit of St. Louis"—Col. Lindbergh's famous plane—was Mahoney built. Since the day it was first rolled out of its hangar it was lubricated with Mobiloil. ¶ Col. Lindbergh's new plane is also Mahoney built. And — it will receive the same Mobiloil protection given its world-famous predecessor. ¶ Mobiloil, in the fraternity of airmen, is a symbol of protection—a guarantee of safe and uninterrupted service. ¶ The protection Mobiloil has given pioneering airmen, including Col. Lindbergh, the U. S. Army Round-the-World fliers and many others, in their daring and dangerous ventures is a supreme tribute to the ability of this quality oil to meet the most exacting operating conditions. ¶ For over 42,000 miles Mobiloil has protected the "Spirit of St. Louis" flown by Col. Lindbergh on his awe-inspiring flights. In all flights in which Mobiloil has been used, it has always been regular stock Mobiloil—never a special run. ¶ The same stock Mobiloil can be purchased at or near any flying field in the world.





GARGOYLE Mobiloil

The World's Quality Oil

Mobiloil

VACUUM OIL COMPANY

COL. CHAS. LINDBERGH'S *new ship, a standard Ryan Brougham, is equipped with Eclipse Series 6 Combination Hand and Electrically operated Starter. The plane was built by the Mahoney Aircraft Corporation and is powered by a Wright Whirlwind motor.*



All RYAN Planes
are Standard Equipped with
Eclipse Starters

ALL users of Ryan planes have the assurance of safe, quick starting through the convenience of Eclipse Inertia Starters, which are original equipment. Practically every plane with a modern engine can have the same starting advantages, for Eclipse Aviation Engine Starters are produced in a wide range of types and sizes.

Write for full information

ECLIPSE MACHINE COMPANY
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AVIATION ENGINE STARTERS
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STANDARDIZED
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Lindy's New Ryan Monoplane is Equipped with Belden Wire

MATERIALS were selected with the utmost care by the B. F. Mahoney Aircraft Corporation for the new monoplane recently built for the nation's air hero, Colonel Charles A. Lindbergh.

It is significant that Belden Wire is used throughout for navigation lights, landing lights, electric starter, and all other low-tension wiring on this plane, to which the eyes of the nation are turned.

Belden Manufacturing Co. 2304-B S. Western Ave. Chicago, Illinois

Specify Belden

Consult Belden Airplane Engineers regarding specially designed airplane harnesses—either high or low tension—radio shielded or unshielded.



THEN
and
NOW

ON "The Spirit of St. Louis" was a Standard Steel Propeller when it made its great flights.

NOW—the choice of Colonel Lindbergh, based on experience and preference, is another Mahoney monoplane equipped with the same type of propeller.

Follow the choice of experience!

STANDARD
PITTSBURGH
PENNSYLVANIA
STEEL PROPELLER CO.

KNAPP FLYING SERVICE

Distributors of the

RYAN

Brougham

Airport
Ypsilanti, Michigan

LINDBERGH FLIES
on
WINGS OF WOOD
In His Great Achievements

HIS splendid ships, the "SPIRIT OF ST. LOUIS" and his new plane, were manufactured by the B. F. MAHONEY AIRCRAFT CORPORATION, who used our Spruce.

Modern, efficient aircraft manufacturing methods have eliminated unnecessary wood working. Spruce Spars, Ribstock, etc., kiln dried to meet government specifications, are supplied by us in neat sizes, convenient for aircraft manufacturers.

Quality unquestioned. We control the production of our Sitka Spruce from the tree to the finished product. Suppliers of Spruce for 25 years.

Our Spruce is also used on Colonel Lindbergh's new ship

J. V. G. POSEY & COMPANY
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MIDWEST
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DISTRIBUTORS FOR
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THE B. F. MAHONEY AIRCRAFT CORPORATION,

knowing from experience, the importance of strength and reliability in every detail of the manufacture of its planes, specifies Wood's Elastic Shock Absorber Cord for landing gear.

Pioneers in the manufacture of elastic cord for shock absorbers, in this country.

Write for details and prices.

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Manufacturers of
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FLIGHTEX FABRIC

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SAFETY

Exceeds U. S. Army and Navy Specifications


B. F. MAHONEY AIRCRAFT CORP.
SAN DIEGO, CALIFORNIA

APRIL 1 7 19—29

E. S. Twining and Company
320 Broadway
New York City

Attention: Mr. V. Dietz, Jr.

Gentlemen:

You will be interested to know that Flightex Fabric has been used to cover Lindbergh's new plane, a standard Ryan Brougham, just delivered to him from our San Diego factory.

Flightex Fabric was also used to cover the Spirit of St. Louis, and we have found it to be very satisfactory on all of the planes built by us.

Very truly yours,

B. F. MAHONEY AIRCRAFT CORP
(Owners of Ryan Airlines)

By: T. P. Mahoney

TPM:WH

SERVICE
Always

DELIVERY
Immediate

ENDURANCE

The "Spirit of St. Louis," after flying over 50,000 miles under all weather conditions, still retains its original covering of Flightex Fabric.

E. S. TWINING & COMPANY

320 Broadway New York, N. Y.

COLONEL LINDBERGH'S

new plane is equipped

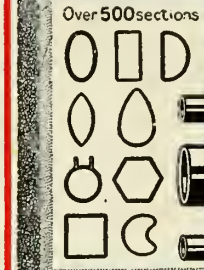
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J. & J. Aerokit

The Aerokit is the handiest thing of the kind ever made. Contains everything needed for the quick treatment of wounds. Designed under the supervision of the U. S. Department of Commerce and approved by it. Meets minimum requirements of three-place planes. Stows away in almost no space at all. Price, $3.

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Weldless steel tubing.



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SUMMERILL SEAMLESS TUBING

was used in

The
"Spirit of St. Louis"
and
Colonel Lindbergh's second plane built by
B. F. MAHONEY
Aircraft Corporation

Summerill Tubing Co.
Bridgeport, Montg. Co., Pennsylvania

SUMMERILL SEAMLESS TUBING

The B. F. Mahoney Aircraft Corporation uses Scully Air Mail Helmets exclusively.



Richard Walling, popular screen star and aviation fan, wearing Scully Helmet.

To the builders of the "Spirit of St. Louis": The makers of SCULLY AIR MAIL HELMETS, in recognition of the wonderful achievements and progress of the B. F. Mahoney Aircraft Corporation, extend their sincere wishes for your continued success.

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INC.
725 E. Washington St., Los Angeles, California
Manufacturers and distributors for the West.

NICHOLAS BEAZLEY AIRPLANE CO.
Marshall, Mo.
Distributors for the United States from Denver East.

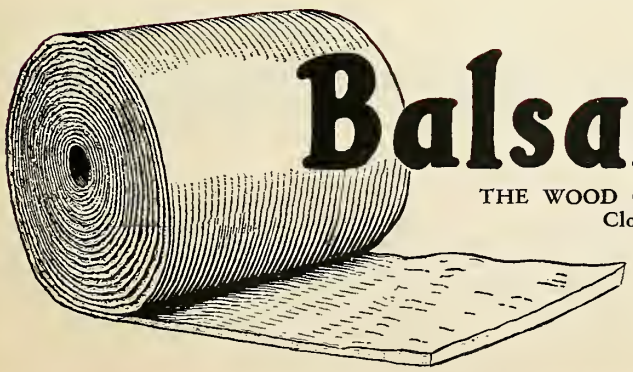


LUXURY

The finest of airplane construction, the utmost in performance and reliability, are outstanding characteristics of the new Mahoney Brougham. Combined with these are appointments and details of finish that provide extreme comfort to air travelers.

The cabin of Colonel Lindbergh's new plane is insulated against sound, change in temperature and vibration with Balsam-Wool.

Full particulars will be sent to Aircraft manufacturers on request.



Balsam-Wool

THE WOOD CONVERSION COMPANY
Cloquet, Minnesota

WEYERHAEUSER FOREST PRODUCTS

The
Dickerson Steel Company
Dayton, Ohio



Aircraft Steels
To Government Specifications

PUROX
100%

Purox oxygen, acetylene and equipment were used in the construction of the "Spirit of St. Louis."

In building Ryan Brougham No. 69, Colonel Lindbergh's new plane, Purox products were used 100%.

CALIFORNIA COMPRESSED GAS CO.
2305 East 52nd Street
Los Angeles, Calif.

THE advertisements in this special section represent organizations which furnish the B. F. Mahoney Aircraft Corporation with supplies, materials and accessories.

We wish to express our congratulations to all who have contributed to the success of Mahoney Aircraft.

AERO DIGEST
THE MAGAZINE OF THE AIR

Western Representative
Frank E. Samuels, 1129 Mohawk Street, Los Angeles, Calif.



Col. Lindbergh's new Ship lands on Aerol Struts



America's premier flyer is now remembered among those pilots who land on Aerol Struts. The B. F. Mahoney Aircraft Corporation have equipped Col. Lindbergh's new Brougham with these highly efficient shock absorbing struts.

It is significant that an ever increasing number of pilots are accepting Aerol Struts as affording the maximum margin of landing safety, even under emergency conditions. They mean greater protection to man and ship and unequaled taxiing comfort over almost any ground.

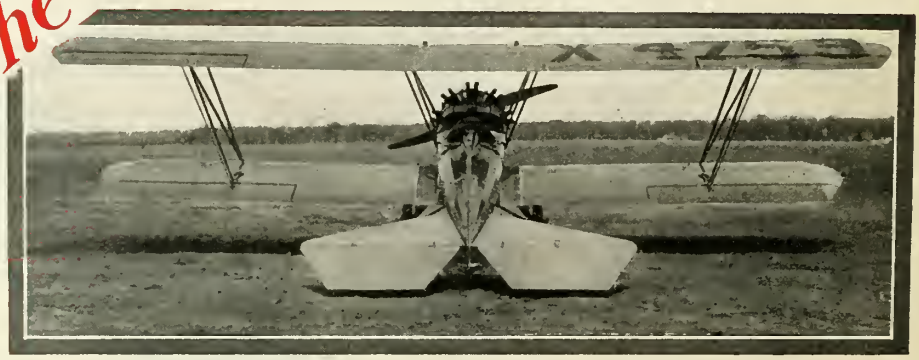
Let us send you a copy of our new illustrated catalog — just off the press.

THE CLEVELAND PNEUMATIC TOOL CO.
3735 E. 78th St. **Cleveland, O.**

"ASK THE PILOTS WHO LAND ON THEM"

AEROL *shock absorbing* STRUT

The most natural thing in the world



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Minn.—Minnesota Aircraft Co., 406 6th Ave., Minneapolis.
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N. Ill.—Jack Oates, Inc., 5101 W. Madison, Chicago.
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So. Carolina and Ga.—Errett Williams, Texas Co., Spartanburg, S. Car.
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IT IS ONLY NATURAL that the Eaglerock with any one of the new production air cooled motors would out-perform other ships —

BECAUSE

— the OX5 Eaglerock did so consistently — and all changes made have been toward greater efficiency and strength.

The Eaglerock with detachable motor mount has greater ruggedness than ever before, to take care of all new production motors up to 260 h.p.

The Eaglerock, less motor and propeller, sells for $2,250. To figure the price complete, add the list price of motor and the propeller of your selection.

Menasco, 260 h.p.	$2750
Ryan Siemens, 120 h.p.	4970
Whirlwind J-5, 220 h.p.	4980
Anzani, 120 h.p.	2167.50
Fairchild Caminez, 135 h.p.	2480

Our distributors will be glad to explain the latest Eaglerock developments, prices, time payment plan, dealership opportunities or approximate delivery date for your ship.

ALEXANDER AIRCRAFT CO.

Room 403 Alexander Industries Bldg., Denver, Colorado.



Wax-free

gives a tougher, heat-resisting body [*All-weather protection*]

More interesting than its rigid specifications is the performance record of A-M-L-O. ⊙After twenty hours of high speed running in a Curtiss OX-5 motor A-M-L-O was drained and tested. The body was still good, and dilution was hard to notice . . . the oil was too good to throw away.

⊙*Name and full details on request.*

Free Pilot's Log Book, 36 pages of blank forms with handsome, durable cover. Free to you, send the coupon.

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Fort Worth, Texas.

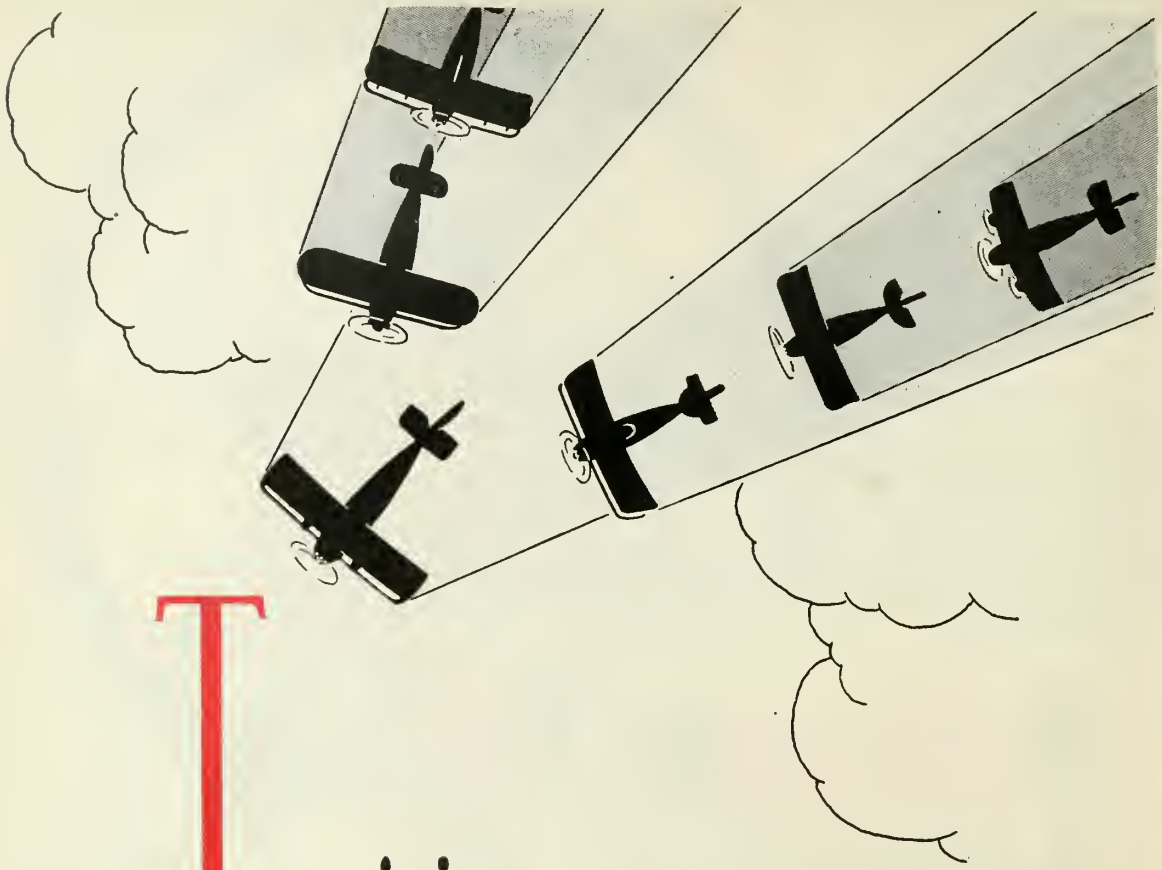
Please send me, without obligation, your Pilot's Log Book described above.

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Taxi in *and fuel with Phillips*

—A stable 100% natural gasoline made especially for Aviation use by the world's largest manufacturer of natural gasoline.

Selected and used by Boeing Air Transport Incorporated as the proper aviation gasoline to carry out the important mission of transporting mail and passengers over the trans-continental air mail route between Chicago and Salt Lake.

The fuel which carried the victorious Travel Air Ship Woolaroc in its flight to Honolulu.

Now available at Chicago, Iowa City, Des Moines, Omaha, North Platte, Cheyenne, Rock Springs, Salt Lake, Wichita, Bartlesville and Amarillo Air Ports.

(USE AIR MAIL)

Phillips 77
Aviation

Phillips Petroleum Co.
Bartlesville, Oklahoma

WORLD'S LARGEST MANUFACTURER OF NATURAL GASOLINE

The Detroit All-American Aircraft Show proved without shadow of a doubt that we have a commercial aviation industry

Everyone attending the aircraft show in Detroit in April came away convinced that commercial aviation has arrived in America. Even some of the old-timers in aviation were surprised.

New planes – new engines – new accessories!

Well-known ships in new form. Monoplanes, biplanes, closed cabin jobs, flying boats, amphibians — from the smallest single seater to large air transports. Everything exhibited — concrete evidence of the progress of aviation.

But despite many factories being over sold — temporarily, aviation must still be sold to the general public. Steady production is necessary to maintain and lower prices, air-mail must be consistently increased — the markets for aviation must be built as we go along — built in advance.

Never before has a new industry had the opportunity to organize its promotion that now confronts aviation. We've been talking about co-operation for many months — not only through these columns but personally with many of the leaders in the industry.

Our plan meets with general approval because it is designed to help aviation in two fundamental ways. The whole thing is a matter of organization. We're ready to do our part — in fact we've already started. But aviation is, by its very nature, a national business, so its been slow work making the rounds.

If you have not been in communication with us or talked to us, please write us fully about your ideas on this very important subject. We want an expression from every one interested in aviation. Very soon we shall have something decidedly definite to announce.

REIMERS & OSBORN, Inc.

ADVERTISING

285 MADISON AVENUE, NEW YORK

We maintain a highly specialized department of aeronautics for the benefit of aviation clients, manned by men who know aviation by flying and working in its commercial developments. Our aeronautic files are comprehensive.

TECHNICAL

VELIE AIRCRAFT ENGINE

VELIE MOTORS CORPORATION announce production of their new five cylinder seventy h.p. radial aircraft engine, which has been extensively tested in Monocoupe planes produced by Mono Aircraft Incorporated of Moline, Illinois. Installed in the two-place enclosed Monocoupe, it is reported to take off in three to five seconds; cruises at eighty-five m.p.h., high speed one hundred m.p.h., landing speed thirty to thirty-five m.p.h. Twenty-five gallons of gasoline give it a range of about four hundred miles or twenty miles per gallon. A fuel mixture control from the cabin insures correct carburetion at all altitudes.

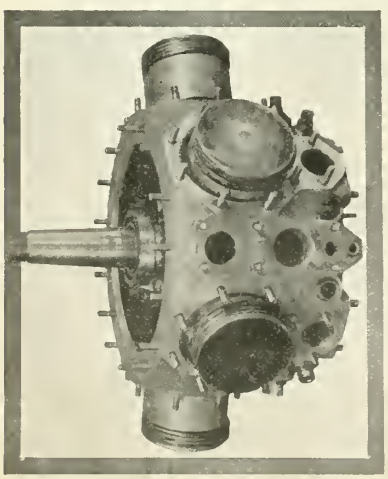
It has five air cooled radial cylinders of four and one-eighth inches bore and three and three-quarters inches stroke and is rated at seventy h.p. at eighteen hundred revolutions per minute.

Some of its features are its solid master connection rod and two-piece crankshaft, simple valve mechanism, and clean lines in front, making for minimum projected area and low head resistance.

The main crankcase is in one piece and the mounting ring is integral. Magnetos, oil pump and tachometer drive are carried on the gear case cover.

The nose or front section carries a deep groove ball bearing which transmits the thrust of the propeller from the shaft to the engine mounting by way of the crankcase.

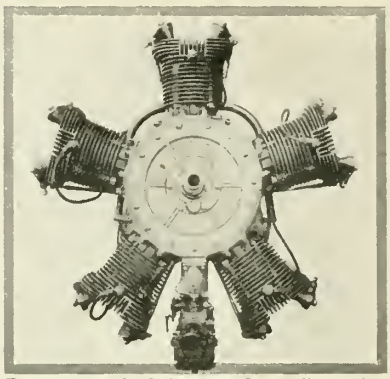
The single throw two-piece crankshaft is supported on three ball bearings placed one on each side of the crank pin and the third just behind the propeller hub, which take the propeller thrust as well as the radial load.



Assembly of the crank, crankcase, pistons and rods of the Velie engine.

To assemble the single piece master rod the shaft is divided into two rear sections, the crank pin being integral with the forward section which transmits the power to the propeller hub carried by it. The crank pin telescopes into the rear section and is carried completely through it.

The master connecting rod is of the solid big end type. This construction makes possible high crank speeds. A babbit bushing spun in the rod bears directly on the crank pin.



Propeller end of the new five-cylinder 70-horsepower Velie aircraft engine.

Four connecting link rods are attached to the master rod by means of wrist pins.

Link rods are bronze bushed for the piston and wrist pins, oil being carried under pressure to all bearings.

The cylinders of nickel steel have integral fins and the heads are of aluminum alloy. Each cylinder has one inlet and one exhaust valve, seating on aluminum bronze surfaces.

On the block and under flying conditions its low temperature has been pronounced. This result is due to the head construction, large fins and valve arrangements.

Valves are of silchrome steel one and eleven-sixteenth inches diameter with eleven thirty-second inch stems, seating on aluminum bronze. Valve lifters are of the roller type, both the intake and exhaust operating from the same cam.

The oil pump assembly consists of two gear pumps, one supplying oil pressure to the engine bearings and the other for scavenging. Oil is taken from the tank by the pressure pump and is delivered to the oil collector ring where it is forced through the center of the crankshaft to crank pin and wrist pin bearings. The discharged oil is returned to the oil supply tank by a scavenger pump. There are only two oil lines, one an inlet or suction line and the outlet or scavenger line.

The skirt of the cylinders extends into the crankcase, acting as an oil shield, keeping excess oil from entering the cylinders.

Ignition is furnished by two Scintilla five cylinder magnetos located at the rear of the engine. They fire two A.C. spark plugs in each of the five cylinders, thus giving two independent sources of ignition.

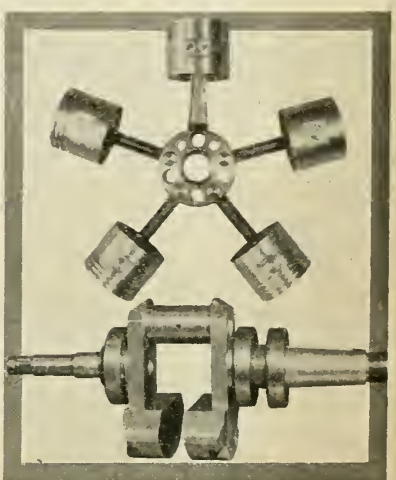
The motor is equipped to take standard mounting of Eclipse electric starter, which complete with battery, weighs only forty pounds.

The engine is completely equipped, ready to run and includes Zenith carburetor, carburetor heater, two magnetos, propeller hub, mounting rings integral with crank case, exhaust ring, complete set of tools and instruction book.

The factory is now completely tooled and in quantity production.

SPECIFICATIONS

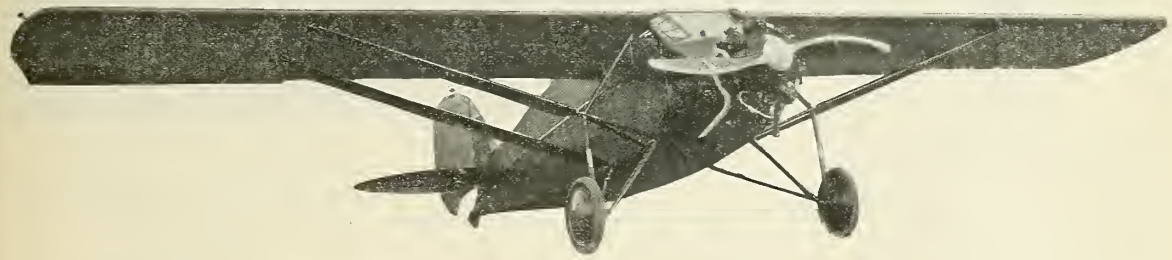
Rated power at sea level	70 h.p. at 1800 r.p.m.
Maximum power at sea level	80 h.p. at 2000 r.p.m.
Weight dry without hub or starter	210 pounds
Weight per rated h.p.	2.63 pounds
Stroke	3¾ inches
Bore	4⅛ inches
Compression ratio	5.2
Cylinder displacement	250.6 cubic inches
Diameter of mounting	12¾ inches
Height or overall diameter	32 inches
Length without starter	27 inches
Fuel consumption at rated h.p.	.55 pounds per h.p. per hr.
Oil consumption	.025 pounds per h.p. per hr.



Velie piston assembly showing the one-piece master rod. Below, the crankshaft.

The New STINSON DETROITER *JUNIOR*

FOUR PLACE CABIN MONOPLANE



A moderately priced, good airplane, roomy, fully equipped, powered by the Warner Scarab 120 H.P. engine.

The ***Stinson Junior,*** received with unbounded enthusiasm at the All American Aircraft Show, meets a long felt need in the light commercial class.

The same high standards of design and construction which give Stinson ships such a high degree of efficiency and performance are found in the Junior.

The Stinson Junior Monoplane is ideal for private owners, business concerns and commercial operators. Flying schools should investigate the Junior.

Complete information on request.

Stinson Aircraft Corporation

Northville, Mich.

We are prepared to furnish operating costs and surveys to individuals or organizations who desire to purchase aircraft for personal or commercial uses.

THE HALPIN "FLAMINGO"

THE Halpin "Flamingo" is a high-wing all-metal monoplane designed to give the speed and reserve power demanded by the commercial operator and the private owner. It was designed and developed by the Halpin Development Company of Cincinnati, Ohio, from the experience of a group of men who for years have been prominently identified with all-metal aircraft construction. The project was financed by T. Higbee Embry of the Embry-Riddle Company, operators of the air mail route between Cincinnati and Chicago.

It is powered with a 410 h.p. Pratt & Whitney "Wasp" engine, has a high speed of 140 miles an hour and a cruising speed of 120 miles an hour. The cruising radius is 1,000 miles. The cabin seats a pilot and five passengers. Toilet and washroom facilities are provided as well as a mail and baggage compartment of 40 cubic feet capacity.

The need of such a plane has long been apparent among commercial operators and private owners in this country. Their requirements were constantly in view in the design of the plane. This resulted in all-metal construction, a policy to which the designers are firmly committed, ample reserve power, a higher cruising speed, and simplified construction which results in economy.

Thus, the Halpin "Flamingo" satisfies the operator with low operating and maintenance cost, and the pilot with reserve power, exceptional flying qualities, and a higher cruising speed.

Economy of production in the "Flamingo" results from simplified methods of construction throughout the plane.

The wing is of the semi-thick, high-lift type, having lift braces attached at 58 per cent of the span. It is constructed entirely of duraluminum, the spars being of I section, the flanges built of extruded angles, with a dural web set between them. There are 28 ribs in the whole wing, made of flat dural sheet, all exactly alike, with holes punched and flanged to give lightness and rigidity. There is drag bracing in the two inner bays, the skin taking the drag load in the outer bay. The drag struts are steel tubes with end fittings to take the swaged drag wires.

Two gas tanks of 75 gallon capacity each are placed in the wings. The tanks are constructed of terne plate having a 3½" diameter filler neck, which permits of filling without the use of a funnel.



Wings are pin-jointed to the side of the fuselage utilizing the entire depth of the wing for cabin space. The entire wing is covered with a .014 inch dural skin, corrugated on four-inch centers with a semicircular corrugation. Ailerons are of the conventional type, differentially controlled and set in one foot from the wing tips.

The fuselage is of welded seamless steel tube construction throughout. The metal skin is fastened to light dural channels riveted to clips placed on the tubes. The main cabin is 44" wide, 60" high and 108" long, and fitted with upholstered reed chairs secured to the floor. There is one wide door on the right side of the main cabin, and one door on the left side of the pilot's compartment. The cabin is finished in gray duotone embossed fibre board, trimmed in red, with aluminum strips around windows and doors. The ceiling is fitted with dome lights. There are 10 feet of continuous windows, 14" wide on each side of the cabin. The glass is ¼" plate, with edges ground and polished. The glass surrounding the pilot's cockpit is non-shatterable.

The undercarriage is of the split-axle type constructed of heat-treated chrome-molybdenum tubing. Sauzedde 30" x 5" wheels are used, fitted with the standard brakes. The shock absorbing units are Aerol struts. The tail wheel is a special development. A wheel formed of sheet steel and faired with aluminum is mounted on an arm connected to shock chord. The wheel has a 3½" flat steel tire. The stern post supports an emergency skid.

The tail surfaces are dural channel structure, covered with standard .014 corrugated dural skin. The fin is adjustable on the ground in two minutes, the stabilizer is rapidly adjusted by a screw operated from the pilot's compartment and is self-locking in any position. The tail surfaces are all of high aspect ratio and externally braced. All control surfaces are mounted on self-aligning ball bearings.

The engine is a Pratt & Whitney "Wasp", developing 410 h.p. at 1900 r.p.m A 10-foot Standard Steel propeller is used. The engine mount is of conventional type with a ring bolted to the crank case. The starter is Eclipse hand inertia, operated from the pilot's compartment by a special rachet device. The oil tank is constructed of aluminum, 14-gallon capacity carrying 12 gallons of oil, mounted forward of the firewall. The firewall is .032" terne plate riveted and soldered to the tubing of the engine mount and bulkhead, so as to prevent any leakage of oil. The engine cowling is .050" aluminum with louvres on each side, the front portion being adjustable for opening and closing the louvres for warm or cold weather. The gasoline is fed from the wing tanks by gravity.

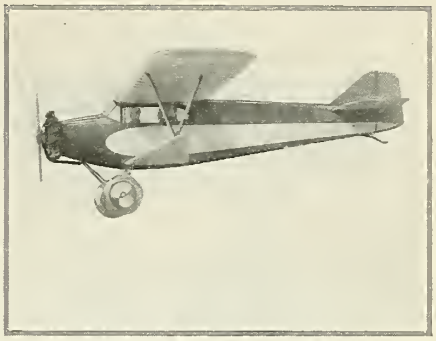
(*Continued on next page*)



The Halpin "Flamingo", an all metal cabin monoplane with a Pratt & Whitney engine.

NOW THERE ARE THREE TYPES OF BUHL AIRSEDANS

To cover a very wide range of commercial and private uses. Each type is built to the high standards of strength and efficiency which characterize Buhl productions.



The BUHL Junior Airsedan

The Buhl Junior Airsedan is a smaller scale replica of the Standard Airsedan. It carries a useful load of a thousand pounds and maintains a cruising speed of 95 miles per hour.

Specifications:

Weight empty.....1,200 lbs.
Wing span.....36 ft.
Wing area.....240 sq. ft.
Length .....25 ft.
Useful load.....1,000 lbs.
Seating capacity—pilot and 2 passengers

Performance:

High speed (sea level).....110 M.P.H.
Landing speed.....45 M.P.H.
Cruising speed.....95 M.P.H.

Power Plant:

Warner
Horse power.....110 at 1,800 R.P.M.
Fuel capacity.....50 gal.—8 hours
Oil capacity.....3 gal.

The Buhl Special Airsedan is designed for use where load is subordinated to speed. It carries a useful load of 1000 pounds and has a high speed of 132 miles per hour.

Specifications:

Weight empty.....1,500 lbs.
Wing span.....36 ft.
Wing area.....240 sq. ft.
Length .....28 ft.
Useful load.....1,000 lbs.
Seating capacity—pilot and 2 passengers

Performance:

High speed (sea level)....132 M.P.H.
Landing speed.....45 M.P.H.
Cruising speed.....115 M.P.H.

Power Plant:

Whirlwind
Horse power.....200 at 1,800 R.P.M.
Fuel capacity.....80 gal.
Oil capacity.....5 gal.

The Buhl Airsedan is the standard plane of the Buhl line. It accommodates four passengers comfortably in a sound-proof, easy-conversation cabin.

Specifications:

Weight empty.....2,100 lbs.
Wing span.....42 ft.
Wing area.....334 sq. ft.
Length .....28 ft.
Useful load.....1,628 lbs.
Seating capacity—pilot and 4 passengers.

Performance:

High speed (sea level) 120 M.P.H.
Landing speed.....45 M.P.H.
Cruising speed.....100 M.P.H.

Power Plant:

Wright Whirlwind.....J.5
Horse power 200 at 1,800 R.P.M.
Fuel capacity.....70 gal.
Oil capacity.....5 gal.

Department of Commerce Certificate of Airworthiness No. 12

Distributors:

***In the Northwest*—Mamer Flying Service, Spokane, Wash.**
***In the Southwest*—Frank Baker Aircraft, Culver City, Calif.**

BUHL AIRCRAFT CO.

Marysville, Mich.

(*Continued from preceding page*)

Conventional Deperdussen dual controls are used with chain and sprocket to cables over Micarta pulleys to external horns on all surfaces. The rudder pedals are of the stirrup type. Wheel brakes are selective being operated by a hand lever in the center of the pilot's compartment. Pioneer instruments are used and running lights are mounted to conform to Department of Commerce specifications. Provision is also made for landing lights which will streamline into the wing tips.

The material used in the Halpin "Flamingo" comes from all parts of the world. It is drawn from fifteen different industries, and represents the most modern metallurgical advances made by science. The plane does not weigh more than the standard steel, wood and fabric planes of equal size. Its speed is comparable with any similar plane on the American market.

The design of the Halpin "Flamingo" is the result of Mr. T. E. Halpin's manufacturing and operating experience, together with the technical training and ideas of the engineering department, consisting of Ralph R. Graichen, chief engineer, and Walter C. Clayton. Halpin was chief inspector and assistant to the general manager of the Stout Metal Airplane division of the Ford Motor Company, and later in the operations department of the Stout Air Services, on the Detroit-Grand Rapids and Detroit-Cleveland air lines.

Specifications

Wing spread .....48 feet
Wing area .....354 square feet
Wing chord .....8 feet
Length of fuselage.....30 feet
Tread of landing gear.....10 feet
Height over all .....9 feet
Weight empty .....2,784 pounds
Gross weight .....4,850 pounds
Useful load .....2,050 pounds
Capacity, 5 passengers and pilot and 600 pounds of baggage
High speed .....138 to 142 M.P.H.
Cruising speed .....115 to 120 M.P.H.
Landing speed .....48 M.P.H.
Cruising radius. 1,000 miles or 8½ hours of flight
Service ceiling .....18,000 feet
Rate of climb..1,250 to 1,500 feet per minute
Gas consumption .....18 gallons per hour
Oil consumption .....2 quarts per hour
Power plant, Pratt & Whitney "Wasp", 420 H.P.
Total gas capacity .....150 gallons
Total oil capacity.....12 gallons
Cabin space .....195 cubic feet

PITCAIRN SPORT MAILWING

A NEW sport airplane, a modification of the company's Pitcairn Mailwing (PA-5), has just been announced by Pitcairn Aviation, Inc., with headquarters in Philadelphia.

The plane is known as the Pitcairn Sport Mailwing and was exhibited for the first time at the All-American Aircraft Show that was held in Detroit from April 14 to 21. The Pitcairn Mailwing is the mail and express airplane now being used by five contract air mail operators, including the New York to Atlanta air mail service that was inaugurated early in May by Pitcairn Aviation, Inc.

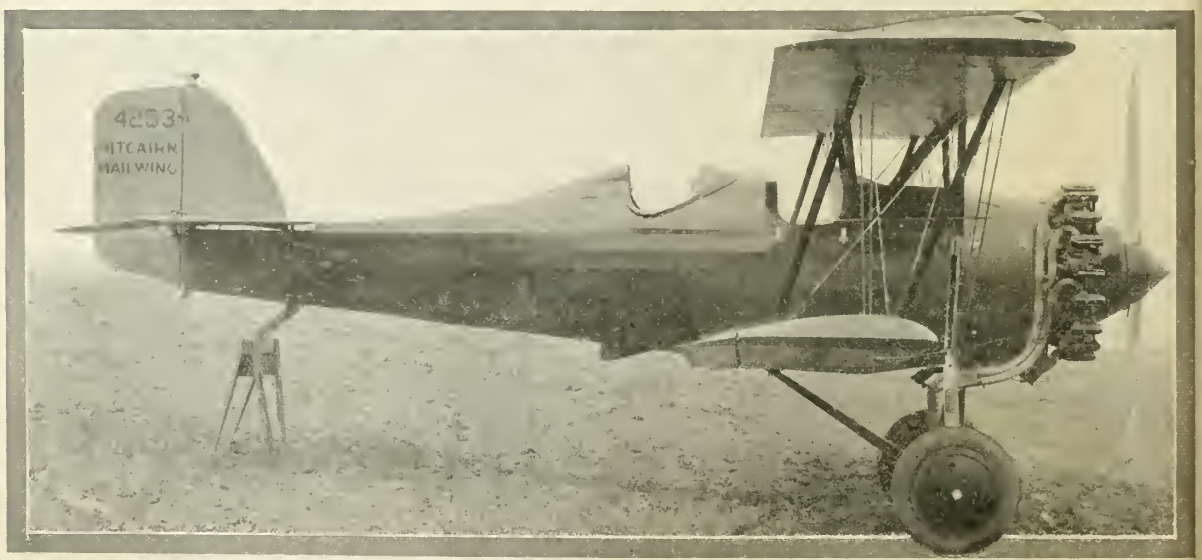
In the Sport Mailwing the large mail compartment is fitted with a comfortable seat ample for one passenger and even large enough for two. The windshield for the passenger cockpit is demountable and the cockpit is provided with a cover which can be put in place when no passengers are being carried, just as the rumble seat of an automobile can be closed when not in use. Since the cover fits into the streamline shape of the fuselage, an appreciable increase in the speed of the plane is gained when the cockpit is closed.

Designed particularly for owner-pilot use, the Sport Mailwing has the same characteristics of size and performance as the Pitcairn Mailwing. It is powered by a Wright Whirlwind J5 engine.

The following are the dimensions of the Pitcairn Sport Mailwing PA-5 and the performance figures: (Capacity, pilot and 500 pounds for baggage and one or two passengers.)

Pitcairn Sport Mailwing PA-5

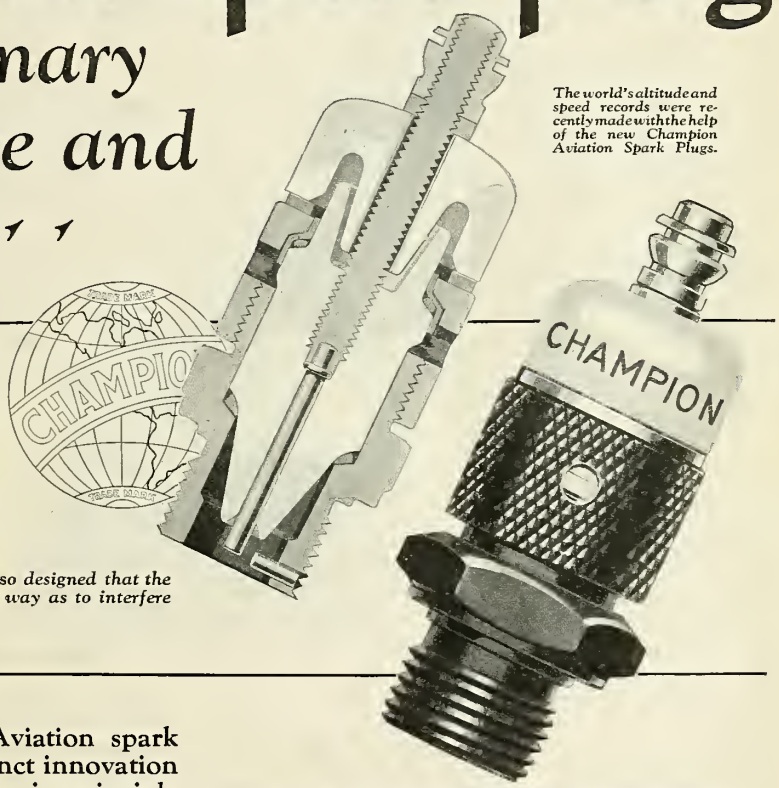
Wing span, upper .....33 feet
Wing span, lower.....30 feet
Over-all length .....21 feet 10½ inches
Over-all height (standing on ground), 9 feet 0 inches
Wing chord, upper .....54 inches
Wing chord, lower.....48 inches
Mean aspect ratio.....7.42
Wing area.....262 square feet
Wing section .....Pitcairn development
Dihedral, upper wing .....1 degree
Dihedral, lower wing .....4 degrees
Gap at fuselage .....62 inches
Stagger .....22 inches
Area of ailerons.....21 square feet
Area of stabilizer.....15.5 square feet
Area of elevator.....14.4 square feet
Area of fin.....4.2 square feet
Area of rudder.....6.4 square feet
Weight, empty .....1,612 pounds
Useful load, maximum.....500 pounds
Total weight .....2,620 pounds
Wing load .....10 pounds per square foot
Power loading (220 H.P.), 11.9 pounds per horsepower
Gasoline capacity .....56 gallons
Performance with normal full load and night flying equipment, high speed at sea level.....131 miles per hour
Rate of climb at sea level (light), 1,600 feet per minute
Rate of climb at 10,000 ft. (light), 1,100 feet per minute
Landing speed (light)....45 miles per hour
Landing speed (loaded)..50 miles per hour



A speed of 131 miles an hour is attained by the new Pitcairn Sport Mailwing. It lands at the rate of 45 miles an hour.

New Champion Aviation spark plug

Revolutionary in Principle and Design



The world's altitude and speed records were recently made with the help of the new Champion Aviation Spark Plugs.

ENTIRELY new principle of design • Exclusive sillimanite insulators—the finest insulating material known • Double insulation—primary protected by secondary "dome" insulator • Cooling areas around insulators • Champion two-piece construction • Absolutely gas-tight against the highest compression ratio • *Entire structure so designed that the insulators cannot be broken in such a way as to interfere with engine operation.*

THE new Champion Aviation spark plug is not only a distinct innovation but is actually revolutionary in principle and design. It has already established new standards of spark plug performance in aircraft engines.

The unique design of the exclusive sillimanite insulators, in which the primary is protected by the secondary "dome" insulator, provides protection and cooling areas impossible in ordinary spark plugs. The entire structure is so designed that it positively cannot be broken in such a way as to interfere with engine operation. Pre-ignition and "cutting out" are practically impossible.

Developed after two years of painstaking research and rigorous tests, the new Champion Aviation spark plug further embodies all the excellence in material and manufacture exclusive to all Champion spark plugs.

Install a complete new set of Champion Aviation spark plugs which bring to your engine a new factor of safety and vastly improved performance and dependability.

Write for descriptive folder

CHAMPION *Spark Plugs*

TOLEDO, OHIO

IRELAND "AMPHIPLANE"

AN enclosed cabin "Amphiplane", one of the first of its kind, recently returned from Detroit where it was on exhibit at the All-American Aircraft Show. This new land-and-water craft, after undergoing successful tests by its manufacturers, Ireland Aircraft, Inc., was flown to Detroit and back to Curtiss Field, Long Island.

The Ireland Amphiplane, with a luxuriously appointed cabin, vies in comforts with a modern enclosed motor car. It is a five place cabin biplane with a cruising speed of 85 m.p.h. and a high speed of 95 m.p.h.

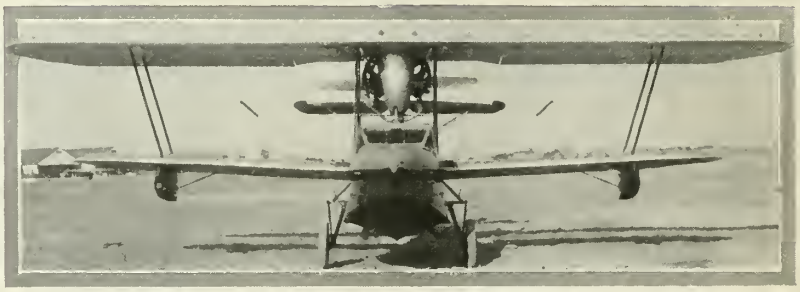
The power plant is a Wright "Whirlwind" mounted as a pusher. Any doubts that may have been held about the cooling of the "Whirlwind" engine when mounted in this manner, have been entirely dispelled. Exhaustive tests have proved that the engine cools perfectly and will give satisfaction under long periods of taxiing on the water as well as on land. The engine mount for the engine is a welded circular tubing of unusually large diameter and wall thickness. Bolted to the main struts are steps to provide a place to stand while making engine adjustments or repairs.

The hull has a molybdenum steel frame with a covering of steel duralumin bolted and screwed to the steel members. It is well streamlined, thus giving the flying boat the necessary qualities to make it seaworthy and navigable on the surface. Around the side of the hull is a narrow shelf or deck. This walk is handy for mooring or getting in or about the hull.

The roomy cabin is of non-corrosive metal construction throughout and is fitted with sliding windows. A completely equipped instrument board is mounted under a single glass panel similar to that used on automobiles. In front of the cabin at the nose of the hull is a compartment for the storage of an anchor.

Interplane bracing is of steamlined duralumin struts and conventional wire bracing. In the hull just below the engine is the main fuel tank with a capacity of 65 gallons. The tank is of duralumin construction. To provide a firm footing when making adjustments, the deck of the hull above the tank is supported by a number of stringers.

Many features of the hull tend to make for easier handling of the plane when not under its own power. In addition to the customary shackle at the nose for mooring there is another shackle or ring on the keel below the water line to provide a low attachment point for towing.



The Ireland amphibian flying boat at Curtiss field, Long Island.

The wheels are mounted on a square tube that slides through a duralumin drum carrying the aileron cables and can be drawn up in about 35 seconds and lowered in 20 seconds.

The tail skid is of oleo design with an air vent to prevent the oil from leaking out. Ailerons and tail surfaces have welded steel rib and dural beams. All control surfaces have been statically tested well above the required load.



Cabin doors of the Ireland amphiplane.

A surprising feature of the Ireland "Amphiplane" is its unusual maneuverability on the ground. By giving hard rudder and "gunning" the engine, it can be turned so sharply that the wheels will skid sideways across the ground. In the air it shows exceptional effectiveness on all controls.

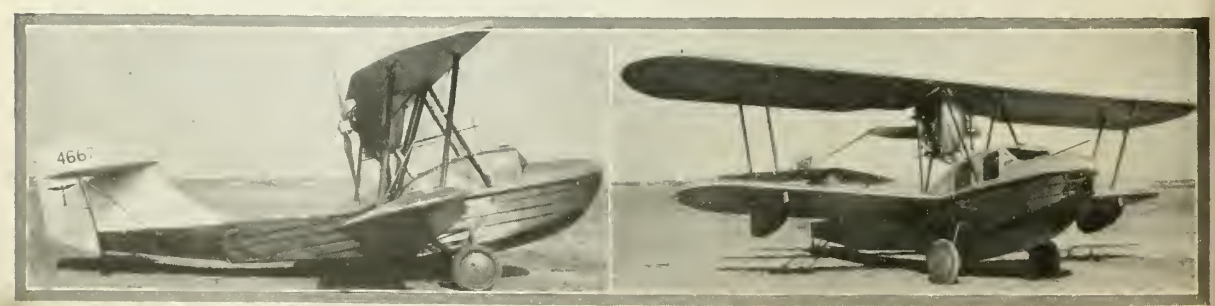
The tendency to stall with the power off has been entirely eliminated. By properly adjusting the stabilizer the ship may be flown "hands off" under any condition of loading.

The interior of the hull is finished in "Rust-Veto" with all steel parts cadmium plated.

Bertram Work is president of the Ireland Aircraft, Inc., and G. Sumner Ireland, designer of this unusual craft which floats on the water, flies in the air and taxiis on land.

Specifications of the "Amphiplane"

Span upper wing	40 feet
Span lower wing	34 feet
Chord	5 feet 6 inches
Wing area, including ailerons	350 sq. ft.
Airfoil	Curtiss C-72
Length	30 feet 6 inches
Height, on wheels	11 feet 6 inches
Tread	7 feet
Width of hull at forward step	5 feet
Aileron area	48 square feet
Horizontal tail area	46 square feet
Vertical tail area	32 square feet
Weight empty	2250 pounds
Pay load	750 pounds
Useful load	1358 pounds
Normal gross weight, fully loaded	3608 lbs.
High speed at sea level, full load	95 m. p. h.
Cruising speed, full load	85 m. p. h.
Landing speed, full load	46 m. p. h.
Climb at sea level, full load	650 f. p. m.
Climb to 10,000 feet, full load	35 min.
Service ceiling	11,000 feet
Absolute ceiling	12,000 feet
Fuel capacity	65 gallons
Normal range	375 miles
Engine	Wright "Whirlwind" J-5-C
Propeller	Curtiss-Reed, 9 feet diameter



The Wright Whirlwind engine used as a pusher, cools perfectly in the "Amphiplane" installation.

WRIGHT·BUILT·ENGINES

"That must be a good engine!"



GREAT records are made with the Wright Engine: the reward is the popular comment—"That must be a good engine."

Even to the man in the street the name of Wright is significant.

"A good engine"—alone it carries on for hours without missing, for miles without stopping. "A good engine"—seemingly without fatigue, a power-plant that knows no exhaustion, whose performance is so consistent that it seems to have no limits.

"A good engine"—but back of that popular comment is a story of conception, design, workmanship, assembly, tests by the hundred, and infinite care to every detail that makes a good engine, not by chance, but by deliberate intention.

Wright Engines were born in the Great War and reared in the atmosphere of successful air activities. Their tests came every day. They proved their ability in the vital ebb and flow of war necessity. Their performances helped make "aces" of pilots whose names are still remembered.

Wright was drafted in the early war-time days to produce an engine capable of standing war-time necessities for durability, sustained speed, maneuverability and endurance. The Wright organization placed unsurpassed methods of design and workmanship at the disposal of foreign governments and the United States and developed aircraft engines which were unmatched in quality of workmanship and performance.

With this background, followed by further development for nearly 14 years, it is but logical that these engines perform as they do. Believing that the entire aeronautical industry will be interested in knowing how carefully and surely Wright Engines are built, unusual processes will be described in a series of advertisements of which this is the first.



Wright "Cyclone" Aeronautical Engine

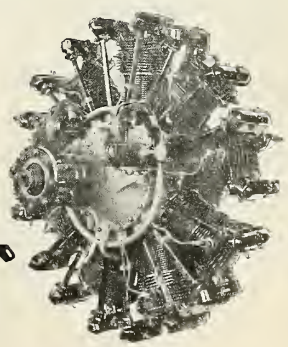
That's why More Pilots fly them!

WRIGHT

WRIGHT AERONAUTICAL CORPORATION

Paterson, New Jersey, U. S. A.

CANADIAN WRIGHT LIMITED, Sole Licensees for Canada, Montreal



Wright "Whirlwind" Aeronautical Engine

KINNER Folding Wing "COURIER"

REPRESENTING an effort to reduce the mounting costs of hangar space for light commercial aircraft, W. B. Kinner, nationally known designer, has perfected and flown a new folding wing monoplane that can be stored in a garage 8 by 10 by 25 feet in dimensions. The new ship is powered with a 100 horsepower Kinner five-cylinder radial air-cooled engine.

The original plane is a two-place open ship with gasoline supply for 800 miles cruising. Two and three-place open and closed models will be available with the same wing spread and folding wing feature.

The Kinner Courier, as the new ship is known, has a spread of 35 feet and a top speed with the Kinner engine of 120 miles per hour. The landing speed, an exceptionally low one for monoplanes, is 35 miles per hour. The wings are tapered, their mean chord being six feet. The total wing area is 216 square feet, and the plane, complete with engine, weighs 915 pounds.

A Kinner modification of the 27 wing curve is used in the new monoplane. A flying stabilizer, dual gasoline tanks and lines, N struts, brakes, alemite aileron controls, padlocked wing pins, exhaust collector ring integral with cowling, and adjustable hot air stove for the carburetor are features of the Kinner monoplane.

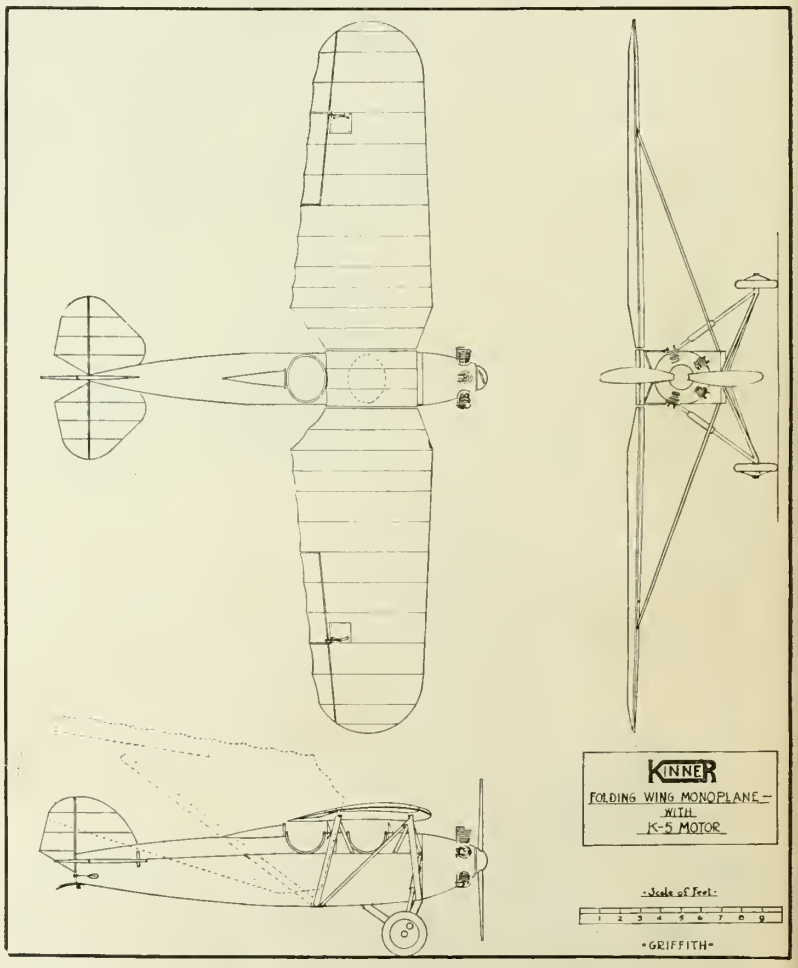
The wings of the new ship can be folded easily by one man in ten minutes, the folding feature being almost automatic. The front wing pins are pulled, the front struts removed and the leading edges of the wings swing toward the ground supported by the hinged rear struts. From this position the wings are pushed back along the fuselage and hooked, ready to wheel the ship into the garage.

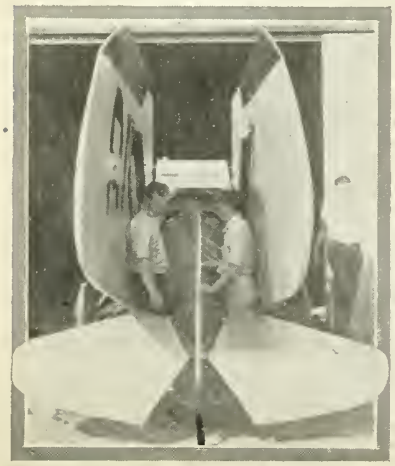
The monoplane, similar to the Kinner Airster biplane, has a take-off in less than 100 feet, and a climb of 900 feet per minute. With brakes, the ship can be landed and stopped in 100 feet.

The first of the Kinner folding wing monoplanes has been purchased by Dr. T. C. Young of Glendale, chairman of the Field Committee for the 1928 National Air Races, and has been designated an official ship for these events.



Compact arrangement of the Kinner monoplane with wings folded.





The Kinner Courier with wings folded.

In addition to standard equipment, Dr. Young's ship is equipped with Sauzedde wheels and brakes, Standard Steel propeller, Gruss Aerol struts, a one-shot fire extinguishing system, Irving parachutes, and extra instruments which were specially fitted.

Specifications

Span	35 feet
Length	23 feet
Height	7 feet
Total wing area	216 square feet
Ailerons	14 square feet

(*Continued on next page*)

This advertisement is a barometer of the Industry's progress — look for it each month

The New
CONSOLIDATED
Aircraft
Instrument Panel
(Type A)



Now Standard on

Curtiss-Robin
Alexander Eaglerock
Arkansas Command-Air
International Aircraft
Mohawk Aircraft
Taylor Bros. Aircraft

5,000 NEW PLANES

will fly this year

Our Instrument Sales *Now* Forecast









AGAIN the rapid progress of the Aircraft Industry in this country is reflected in substantially increased sales of Consolidated Instruments.

Our business has now reached the point where our scheduled deliveries — single instruments and sets — indicate that 1928 production will reach a total of at least 5,000 commercial planes.

Since one or more Consolidated Instruments is standard equipment on most American commercial airplanes, our business is a dependable gauge of the industry's growth.



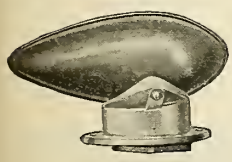


CONSOLIDATED

Instrument Company of America, Inc.

41 East 42nd Street New York

Western Representative—M. E. HULSE, 5391 Broadway, Oakland, Cal.







The type F Star Pathfinder compass is of the magnetic type and represents the latest development in aircraft compasses. It has a built-in compensating unit eliminating the use of troublesome loose magnets. This unit is readily accessible for adjustment by means of a removable cover plate. This compass *mounts flush* with the instrument board surface; it has a spherical magnifying cover lens affording great visibility.

Altimeters, Tachometers, Oil Pressure Gauges, Gasoline Gauges, Thermometers, Air Speed Indicators, Compasses, Navigation Lights, Landing Lights, Dash Lights, etc.

(*Continued from preceding page*)

Stabilizers	14 square feet
Elevators	8 square feet
Rudder	4 square feet
Fin	4 square feet
Weight empty	915 pounds
Useful load	550 pounds
High speed	120 miles per hour
Low speed	35 miles per hour
Cruising speed	110 miles per hour
Rate of climb	900 feet per minute
Ceiling	20,000 feet
Cruising range	800 miles
Gas consumption	7 gallons per hour
Oil consumption	2½ pints per hour



The Kinner folding wing monoplane powered with a Kinner engine.

SUPERCHARGERS ARE STANDARD ON NEW AIRCRAFT ENGINES

SUPERCHARGERS especially designed by the General Electric Company will be built as standard equipment into the three new types of aircraft engines with which the Wright Aeronautical Corporation is now experimenting in its test laboratories at Paterson, N. J. By the use of this auxiliary to the engine it is expected that maximum efficiency will be obtained in operation, including easier starting, greater reliability and better performance at high altitudes.

The three new Wright engines, recently announced, are expected to be in regular production by the spring of 1929. The smallest of these, rated at 140 horsepower, will fill the need for two- and three-passenger airplanes; the next, rated 200-220 horsepower, will be the new model of the famous Wright Whirlwind, and the third will be rated 300 horsepower, standing as a power unit just below the Wright Cyclone rated 525 horsepower.

Superchargers have been in frequent use on airplanes ever since the war, but applications have been few and principally on aircraft designed for high altitude flights. The practice in the past has largely been to modify standard engines to accommodate an external supercharger, but the rapid advance in research which has taken place in the past few years has resulted in the design of a supercharger which is now being adopted by all leading airplane manufacturers in this country for engines in sizes up to about 600 horsepower. This device is made a unit part of the engine.

It was as a direct result of the use of these superchargers that a new type of airplane engine was developed. utilizing air cooling, equipped with radial cylinders and having a supercharger built in as an essential item of the engine construction. The supercharger is primarily designed to improve the gasoline distribution and to give a small amount of supercharging when flying near sea level. In most cases, however, it is so arranged that it can be used to maintain sea level power when flying at moderate altitudes. Thus, by maintaining sea level conditions at the engine inlet, airplane engines can develop much higher power at any given altitude than was possible without the supercharger. This makes it possible to carry heavier loads and develop higher speeds.

Superchargers on radial engines consist of a high-speed impeller driven by the engine shaft through gears surrounded by air conduits of the proper shape formed as part of the engine crank case. The only extra parts, therefore, are the comparatively small impeller and a pair of gears.

THE ANDIZ 60 H. P. LIGHT MONOPLANE

THE Andiz, light-weight monoplane, designed and engineered by Lieut. W. H. H. Anderson of Los Angeles, California, will soon be placed before the public.

The manufacturers will be known as the Andiz Aircraft Corporation, located in Los Angeles, California.

The Model 2-60 is a high wing, dual control sport type, powered with the new type Anzani 60-h.p. engine. The wing beams are of the 6-piece eye beam type so constructed as to be a solid structure from tip to tip. The ribs of the Warren truss type with spruce cap strip.

No nails or brads are used, only brass wood screws and casine glue are used throughout all wood members. Fourteen steel tube compression members are used in the wing with all brace and drag wires double. The wing construction constitutes a safety factor of 12.

The fuselage is of steel tube construction, welded throughout. Not a wire bracing or turnbuckle is used in the whole structure.

The landing gear is of the split-type, designed to take maximum ground thrust, which, in turn, is distributed through six points of contact.

The tail group is of steel tube construction, with balanced elevator and rudder.

The plane is primarily designed to meet the demand for a light-weight, two-place economical craft of high performance, as the following specifications show:

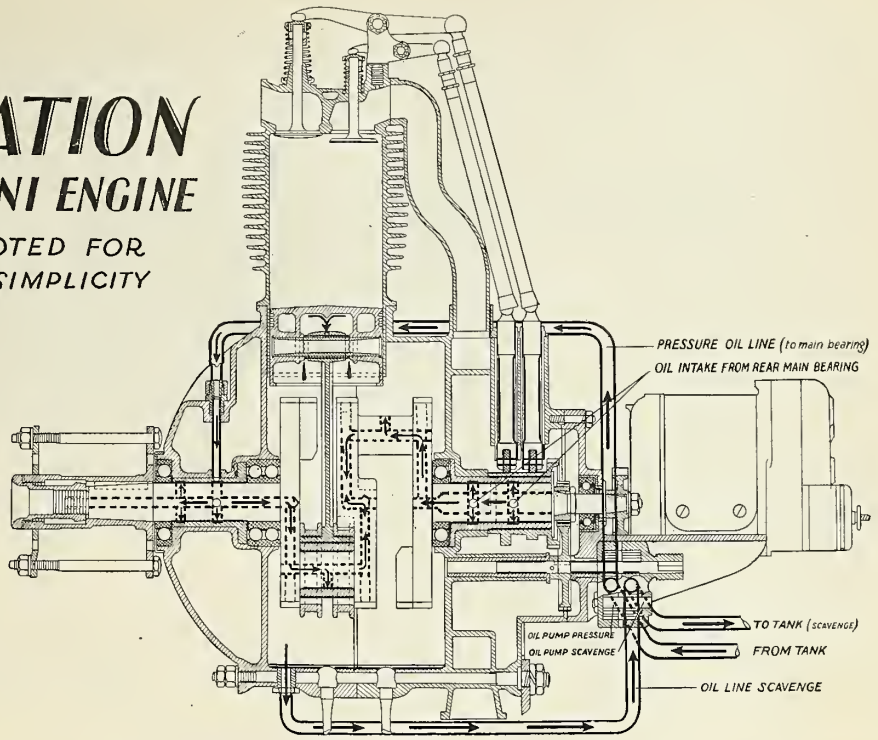
Wing section	Clark Y
Wing span	30 feet
Wing chord	5 feet
Wing area	150 square feet
Length over all	20 feet
Height over all	6 feet
Weight empty	600 pounds
Weight loaded	1,000 pounds
Fuel capacity	16 gallons
Oil capacity	1.5 gallons
Engine, Anzani	60 horsepower
High speed	100 miles per hour
Landing speed	35 miles per hour
Cruising speed	85 miles per hour



The Anzani-engined Andiz light monoplane makes a speed of 100 miles an hour.

LUBRICATION OF THE ANZANI ENGINE

A SYSTEM NOTED FOR ITS EFFECTIVE SIMPLICITY



SINCE the successful operation of any engine depends so much upon a proper supply of oil, the Anzani System was designed with full appreciation of its great importance. Years of development have shown the reliability resulting from the use of simple parts. The principal reason for the unfailing performance of the Anzani lubricating system is its utmost simplicity — its few parts are rugged and easily accessible.

From the tank the oil is led to a pressure pump which forces fresh oil supply to the main bearings and through holes and drilled passages in the crankshaft to the crankpins. The rotary force throws the oil in a fine mist which lubricates cylinder walls, pistons and bearings. Likewise, the timing gears at the rear of the engine are amply lubricated by direct pressure supply. The excess oil collecting in the crankcase is drained through the scavenge line at the bottom of case. The oil before being put into circulation goes through a fine filter and, purified, is led back to the tank.

Proper clearances are given all working parts in order to obtain best results from the use of mineral oil. All Anzani engines are tested with mineral oil (Mobiloil B). Any high grade oil corresponding to Liberty Aero Oil numbers 2 and 3 may be used satisfactorily.

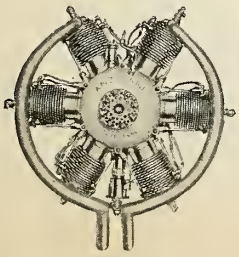
The 1928 model Anzani Engines are especially adapted to American commercial use. They embody many new special features which assure the utmost in economy and dependability of operation for all requirements of from 18 to 120 h. p. We will be glad to furnish complete specifications. Let us know your requirements.

The following stock 1928 models of the Anzani Engine give a power plant range to meet the requirements of light commercial airplanes:

Rated H. P.	*Normal r. p. m.*	*Weight (lbs.)*	*No. of cylinders*	*Bore (inches)*	*Stroke (inches)*	*List Price*
35	1700	115	3	4.133	4.724	$735
60	1700	165	6	3.543	4.724	1325
80	1550	215	6	4.133	4.921	1650
120	1550	320	10	4.133	5.512	2170

The prices quoted are for Engine complete, including magnetos, carburetor and exhaust collector ring.

BROWNBACK MOTOR LABORATORIES, Inc • D-1038 Graybar Building • New York City • *Sole Representatives for the* Anzani Aviation Engine *in* North *and* South America, Australia *and* Japan • *Pacific Coast Distributor:* C. C. LUDLOW, 843 So. Grand Avenue, Los Angeles, California • *Canadian Distributor:* ERICSON AIRCRAFT, LTD., 45 Jarvis Street, Toronto



THE NEW SERIES
RADIAL AIR COOLED

ANZANI ENGINE

THE STEARMAN MODEL C2

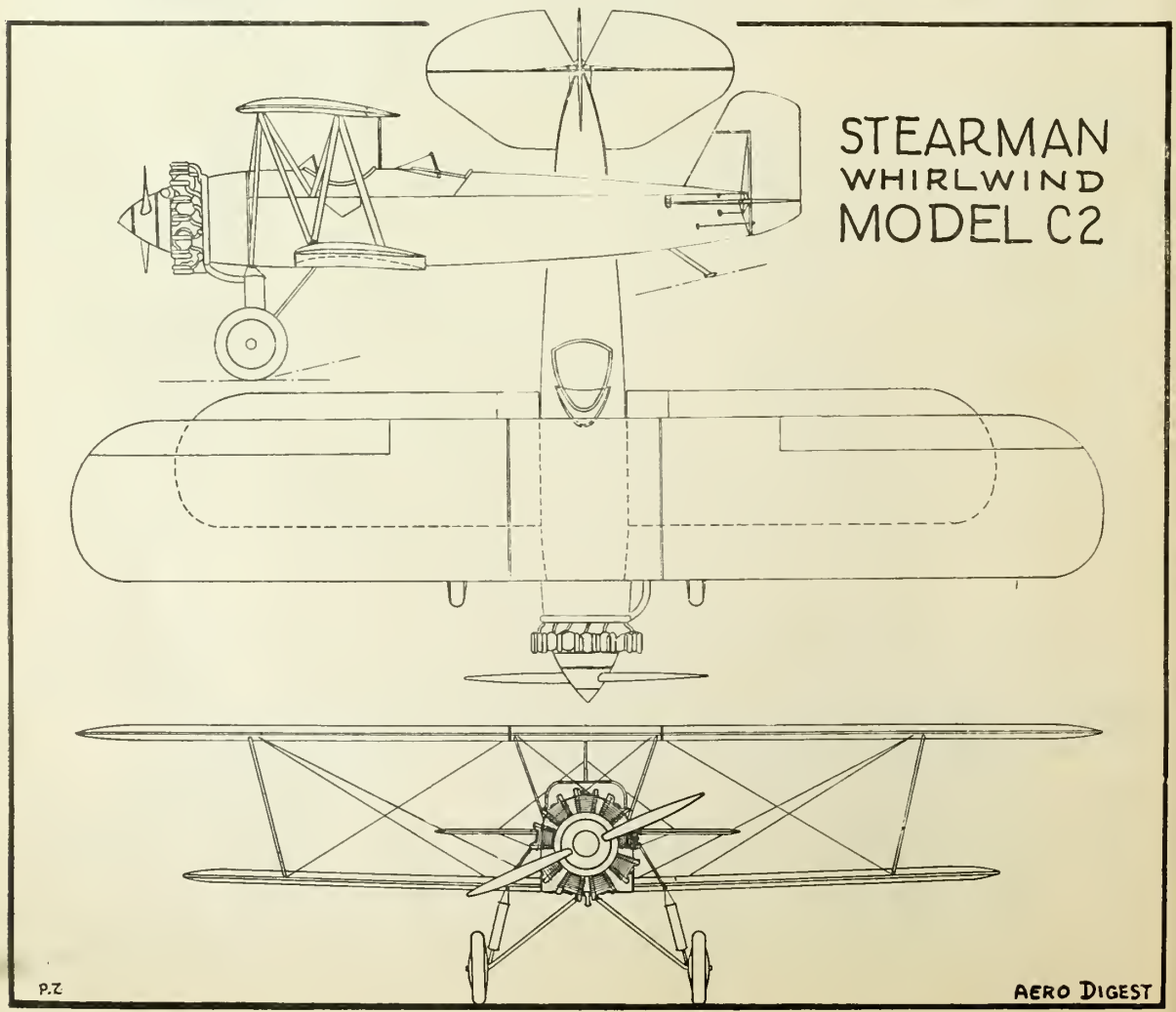
ALTHOUGH the Stearman has been in production for nearly a year it has not been until the past six months that these sturdy little machines could be seen from one coast to another. Late last fall the factory was moved from California to Wichita, Kansas, and after a complete factory layout wherein the production planning was worked out very carefully, a schedule of two airplanes, of the light commercial type, was started.

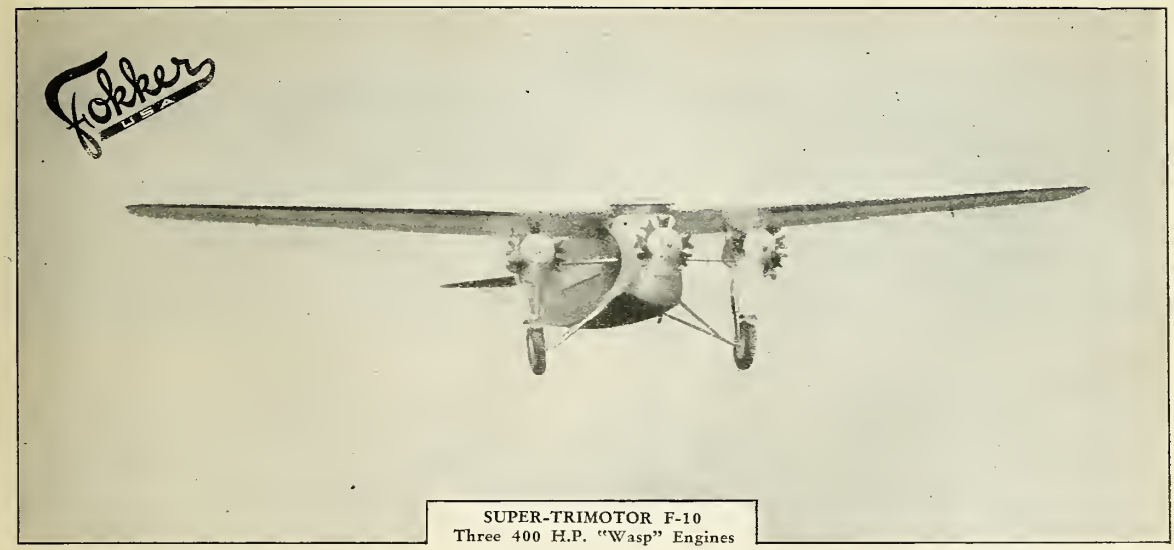
It is believed that to Stearman goes the credit and foresight of designing a machine that would accommodate the varying types of power plant that were to be offered and used in the light commercial class of airplanes. In his basic design, which is now well over a year off the drafting table, he incorporated the idea of building a job that would accommodate any power plant from 90 to 250 horse power, without altering the structure of the craft aft the fire wall. To this end he has been successful as thus far the Stearman has been powered with the OX-5, Model A Hispano, Nordwick Duplex-Cam, Wright Whirlwind and the Menasco-Salmson. To permit this change in power of substantially three fold a careful design was necessary in order that the structural weight would not be excessive for the smaller powered crafts. The final selection of the load factors to be employed were based on a high incidence factor of 8.5.



The wing construction is principally of spruce with streamline steel struts and wires for the external bracing. All internal brace wires are of tie rod. Sheet duralumin is used extensively in the fitting arrangement while thin duralumin covers the leading edge of all the wings. The upper wing panels are wired for navigation lights and the lowers

(*Continued on next page*)





SUPER-TRIMOTOR F-10
Three 400 H.P. "Wasp" Engines

Fokkers *for* Success!

IT is not a coincidence that the most successful air lines use Fokkers. Some owe their success to the fact that they equipped themselves with the dependable Fokker from the start. Others have achieved success through sound judgment and good management in their operations, and then . . . this same leadership points the way to the purchase of the latest Fokker Aircraft.

Notable examples, in widely different fields, are the Western Canada Airways, Ltd., of Winnipeg, Manitoba, and the Pan-American Airways, Inc., of Key West and Havana. Both use Fokker Aircraft!

And now, Western Air Express, the greatest demonstrator of the earning possibilities of air transportation, adopts the new Fokker Super-Trimotor F-10, the greatest Fokker ever built, . . . under the equipment loan made by the Daniel Guggenheim Fund for the Promotion of Aeronautics.

The new Fokkers are winging their daily schedule between Los Angeles and San Francisco, carrying 14 people, Pullman equipment, baggage and 500 lbs. of mail, in luxury and safety, at magic-carpet speed!

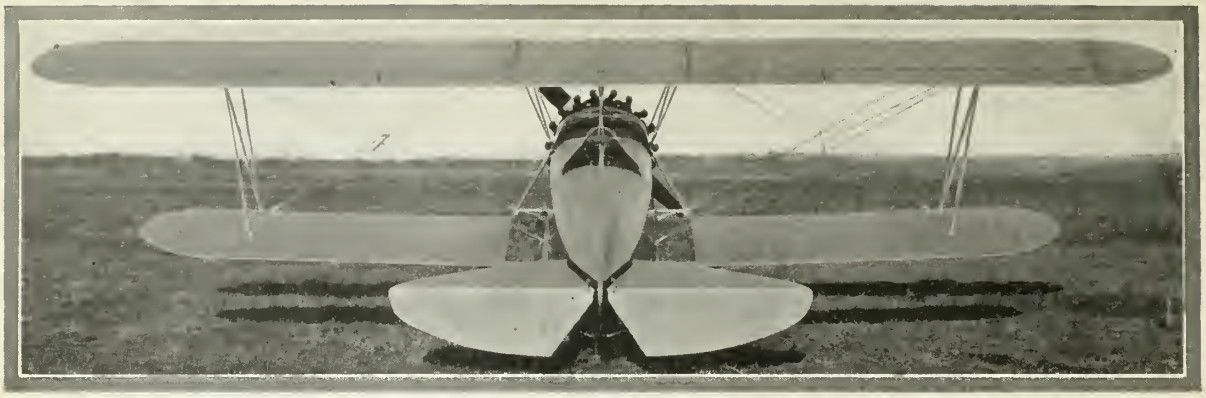
Making 150 miles an hour under the full power of its three Pratt & Whitney "Wasp" engines, over 120 miles an hour at that reduced throttle which means complete reliability and minimum wear and tear, and 1,400 feet per minute climb with full load: such performance sets, in the Fokker F-10, new standards for the world first to gasp at, then to follow.

Specification on Executive Request.

ATLANTIC AIRCRAFT CORPORATION
Factory and Flying Field
Teterboro Airport, Hasbrouck Heights, New Jersey
Subsidiary of FOKKER AIRCRAFT CORPORATION OF AMERICA, *Wheeling, West Virginia*



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Rear view of the Stearman Model C2 equipped with Wright Whirlwind engine.

(*Continued from preceding page*)

are provided with reenforcements for landing lights. A main fuel tank of 38 gallon capacity, carrying a gauge, is located in the center section, with the remainder of the fuel supply carried in the fuselage. Differentially operated unbalanced ailerons are carried on the upper wing only and with these it is possible to secure satisfactory lateral control at stalling speeds of approximately 35 miles per hour. The proportion of areas for the wings are such that the upper has over 50 per cent more area than the lower. This disposition, together with heavy stagger, produces an efficient wing arrangement both from the aerodynamic as well as structural standpoint.

The fuselage structure is entirely of steel tubing which results in the total absence of wires for the web, chord or bulkhead bracing. Chrome molybdenum steel is used extensively in the highly stressed members of the forward section while medium carbon steel constitutes the remainder of the framework. There are a number of ingenious stations incorporated into the fuselage, which provide for the bracing and accommodation of particular items within the body group. Principally among these stations is the one located in the pilot's cockpit where an adjustable seat is combined with the bulkhead truss. All the tubes are slushed with hot linseed oil and protected on the outer surface by aluminum lacquer.

The body fixtures have been arranged with the thought of service and neatness. To this end the cockpits have been lined completely with Fabrikoid, the seats upholstered with chrome tanned leather and all openings sealed against draft. Beside the normal instrument equipment there is included a Pioneer air speed indicator, Pioneer compass and Pioneer fuel strainer. The strainer is conveniently located in the pilot's cockpit, drainable in flight and readily inspected and cleaned. All the piping, wiring and shafting connected with the instrument board is carried through conduits located on the side of the fuselage. An item of interest is the provision of a throttle on each side of rear cockpit, thus satisfying the pilot who is accustomed to either the right or left hand location of the lever.

The empennage is of welded steel tubing, likewise protected against corrosion. The vertical fin and the stabilizer are adjustable, the latter made so by a lever system operated from the rear cockpit.

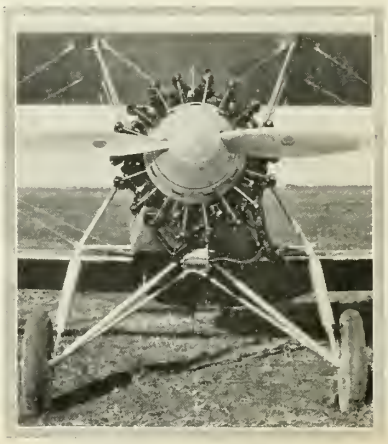
With the realization that from the chassis comes the major portion of the maintenance difficulties, Stearman has laid special emphasis on this item. The introduction of a rubber-hydraulic landing gear was of a pioneering nature as a year ago this type of gear was not known. A total vertical travel of 8 inches is secured through the use of a hydraulic cylinder and the inclusion of rubber shock absorber chord in tension. Tires of 30 x 5 mounted on wheels with integral brakes are included as standard equipment. A wheel tread of 7½ feet is likewise the exception rather than the rule on light commercial aircraft. The tail skid unit is detachable and is using the so called spoon type shoe heavily plated with "Stellite."

Specifications

Span, upper wing	35 feet
Span, lower wing	28 feet
Total wing area	297 square feet
Dihedral, lower wing	2 degrees
Wheel tread	7 feet 6 inches
Incidence angle, both wings	2 degrees
Available cargo space	25 cubic feet
Overall length	23 feet 2 inches
Span of tail surfaces	10 feet 5 inches
Maximum height	9 feet 2½ inches
Width of passenger seat	33½ inches
Normal pay load, two passengers and baggage or	400-500 lbs.
Fuel capacity	68 gallons
Gross weight	2,450 pounds

Full load performance figures:

Maximum speed	130 miles per hour
Landing speed	41 miles per hour
Rate of climb at ground	1100 feet per min.
Service ceiling	18,000 feet
Cruising speed	110 miles per hour



Oleo landing gear on the Stearman.

NEW LUXOR GOGGLE

E. B. MEYROWITZ, Inc., makers of Meyrowitz Luxor Goggles, are offering for the first time their new No. 7 Luxor Goggle, U. S. Air Service model, to the commercial aviation industry. Heretofore this highly developed and improved goggle has been confined to the Army Air Corps and the National Flying Corps.

There are two new major patented features to the No. 7 Luxor: the bridge contains the new clutch type adjustment which consists of a very simple and safe method of adjusting the lenses to fit the spread of the eyes. One little twist of the clutch loosens it and the bridge slides back and forth horizontally. A reverse twist locks it in place. The new bridge is also held in permanent horizontal alignment by the vertical axes at the frame of each end making the No. 7 very strong and substantial.

The other feature is the asymmetrical sponge rubber cushions. These are made with a double lip so that both sides of the metal goggle frame are buried in the resilient spongey rubber. Being asymmetrical in shape they can be adjusted to fit the contour of any pilot's face.

These cushions have only one function to perform and that is to seal the goggle comfortably to the face. The ventilators, which are also a patented feature in every Luxor goggle, are in the metal frames. The intake is at the bottom of the lens frame, where the air is deflected across the inner surface of the lens and goes out through the top of the metal frame. These air streams, which never touch the eye, prevent fogging and sweating of the lenses.

The usual wide and continuous elastic headband common to all Luxor U. S. Air Service models is used, as well as the quickly detachable lenses.

All lenses are carefully formed convexly so that the focal point is located with precision. Any type of lens can be installed, the standard being ground polished and cylindrically bent white lenses.

The Cessna 4-Place Cantilever Cabin Monoplane Powered by Anzani

Cessna Cantilever Cabin Monoplanes have proved their right to be called "The Fastest Planes that Fly"—Horse-power for Horse-power. Lithe as a greyhound, graceful as a swan, their matchless performance is almost unbelievable—*until you actually see them in the air.*

$5750
With Brakes and Air Speed Indicator



These 9-Cylinder Anzani motors have been converted in our own plant. In both block and exhaustive flying tests, they have proved themselves fully worthy to be classed with the best on the market. We stand back of them, in every way. A limited number of Cessna Monoplanes, powered by Anzani, will be available for early delivery. Wire or write us today for further information.

CESSNA AIRCRAFT COMPANY
Wichita, Kansas

AMERICAN MOTH MONOPLANE

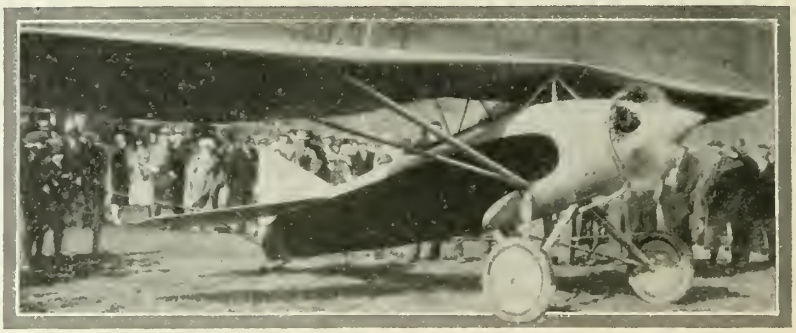
DESIGNED to have a universal appeal the American Moth incorporates practical American construction trends so as to be inexpensive to operate and be adaptable to quantity production. The type is a two seater parasol monoplane with externally braced wings and an air cooled radial engine of approximately 75 h.p.

While a number of airplanes of the class of the American Moth have been put on the market abroad, the appearance of this type in the United States has been delayed owing to the large number of cheaply procurable war aircraft until recently. Although the introductory announcement of the Moth has been withheld heretofore because of extensive tooling for its production, those who have tested and inspected it have pronounced it a most promising design.

The American Moth was designed by by John Pavlecka, who as an engineer of the Ford Motor Company had done designing work on the new Ford car as well as on the Ford three-engine all metal plane. The design of the American Moth has been secured by the Vulcan Aircraft Company in Portsmouth, Ohio, which firm will exploit its production and sales.

The first Moth was built under the supervision of the designer himself, about 4,500 working hours having been required to complete the design and construction. After its completion, the plane was flown about the field for a time aggregating only one-half hour, and then left for a trip to Florida; having covered over 2,500 miles it returned in perfect shape.

Several different materials are employed in the component parts of the plane; the



The American Moth has flown more than 2500 miles; high speed 115 m. p. h.

fuselage is welded of low carbon steel tubing, no wires being used anywhere with the exception of the wing drag truss. There are three main longerons extending all the way from the fire wall to the stern post, two on the top and one at the bottom. Along the length of the cockpit only, near its bottom, two intermediate longerons are used producing a pentagonal structure here which at the tail becomes triangular.

The cockpit contains two seats in tandem; access to the front seat, which is under the center section is from the rear, the backrest of the front seat being made to open and fold out of the way.

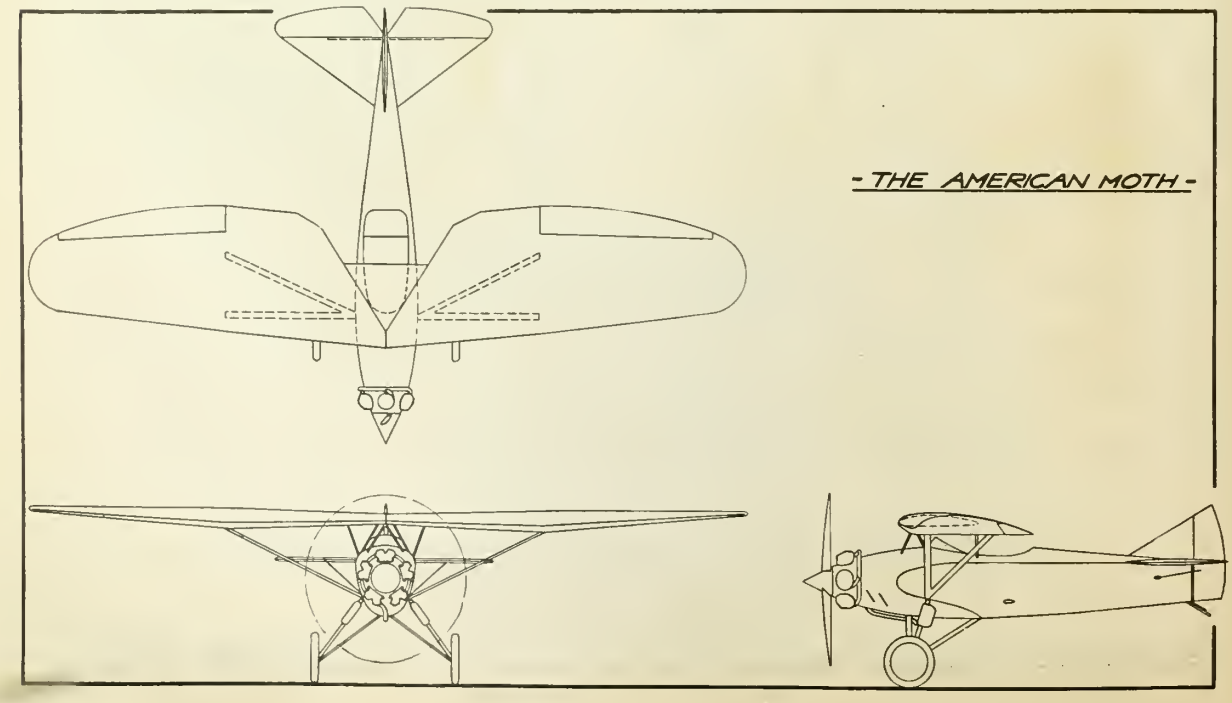
The fuselage terminates in front with a fire wall which consists of one central stress member and two sheet metal pockets welded one at a side to accommodate the pilot's feet on rudder pedals; the stress member is a hollow steel three pointed star with the arms welded to the three main longerons, and including plate fittings for the engine mount. The bottom vertical arm of the star serves also as a support for the rudder pedal bracket.

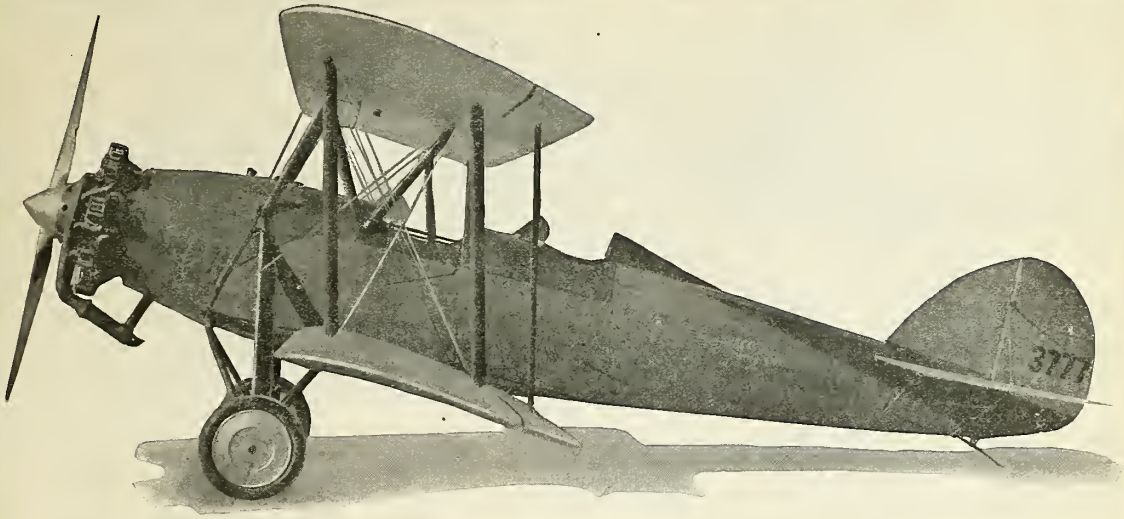
The side truss of the fuselage is of the Warren type. In designing the fuselage structure, the tendency was to use rather few members but heavier ones so as to reduce the number of welded joints to a minimum; this resulted in the fact that there are no redundant members, and the whole structure comprises altogether only 17 joints, all welded, out of which 12 incorporate a fitting, the number of different joints being 11. The largest number of tubular members at any joint is 7, this being the joint where the wing struts attach to the intermediate longeron. All fittings are lugs of low carbon steel plates welded into slotted tubes as reenforcing gussets.

The motor mount is likewise welded of steel tubing; it is bolted to the fuselage at three points, and supports the engine also at three points.

The undercarriage is of the divided axle

(Continued on next page)





The exceptional ability to get in and out of very small fields is another reason for the profits made by WACO operators.

The WACO is now available with OX5-90 H.P Ryan-Siemens, 125 H.P. and Wright Whirlwind, 200 H.P. motors. Type Certificates 11, 13, 26

Write your nearest distributor

Cal., Los Angeles—American Aircraft Corp.
Conn., Hartford—New England Aircraft Corp.
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Wis., Wausau—Northern Airways, Inc.
W. Va., Wheeling—W. Va. Waco Sales
D. C., Washington—Capitol Airways, Inc.
Cuba, Havana—Alfredo Hornedo

WACO AIRPLANES

ADVANCE AIRCRAFT CO.

Troy, Ohio



The American Moth, a 75 h.p. two-seater parasol monoplane.

(*Continued from preceding page*)

type, the unit "Vee" of each tripod being made of streamline tubes pivoted to the bottom longeron at two points and welded to a chrome-molybdenum axle at the wheel. The shock absorber strut consists of two round chrome-molybdenum tubes universally linked between the axle and the fuselage, and telescoping into each other, and each provided with two diametrically opposite racks, 3-16" thick, with a number of holes in them. These racks are welded to the tubes longitudinally, and the tubes telescoped in such a manner that the racks of each are at right angles to those of the other, the racks of the one on the inside sliding in axial slots cut in the outside tube for the telescoping portion of its length. Rubber cord is wound around the strut alternately through the racks on the inner and the outer tube. A travel of 3½" is possible, which provides good shock damping and snubbing action.

The tail skid is made up of two automobile spring leaves; it is held under the stern post in a rigid yoke, and bolted to the bottom longeron ahead of it.

The tail surfaces are of welded steel construction, fabric covered. The shape of the fixed portions of the surfaces is triangular, streamline tubes with their feather edges pointing forward being used to provide the front spar and leading edge.

The wings are pin-joined to the center section which is triangular in plan view, and fully occupied by the gasoline tank. The cabane structure consists of a pyramid in front, and a transverse "W" truss in the rear. The wings have a double dihedral, being thickest at the point where the struts are attached to the spars, and from here tapering both towards the center section and the tip. The ribs are of three pieces—the nose, the middle span, and the trailing portion, all three formed of sheet dural and screwed to spars. In section the ribs are a channel with the web perforated with lightening holes, and the sides turned in at a radius of 7-16". The compression ribs, of which there are two (not counting the end rib which is of steel) are made up of two standard middle spans riveted together web-to-web. The leading edge is reenforced with extra nose pieces and covered with dural sheet up to the front spar.

The ailerons are of the Friese type and have wood spars, dural ribs and dural covered nose. There are two hinges on outriggers of box-like construction, welded of sheet steel, and bolted directly to the wing spar; these outriggers also serve to carry two fairing strips of wood, one at the bottom and one on the top. Wing covering is tacked to these strips, and a dural plate screwed over it to provide a housing for the aileron nose.

The wing struts are steel tubes of streamline profile welded together at the bottom of the "Vee" that they form, with plate fittings welded into their ends.

Dual controls are fitted as standard. The rudder is operated by means of pedals and cables. The joy sticks are provided at their lower ends with round cams that operate slidingly in oblong slots in the pull-and-push rod; the latter has a sliding fit in the torque tube. The elevator control is by rods. For the aileron control the torque tube is provided at the front end with a lever from which cables proceed into the rear wing struts and thence about a pulley in the aileron hinge outriggers to the top horn on the aileron.

The engine that has been adopted is the LeBlond of either the 60 or 90 h.p. rating. The whole round front portion of the fuselage is enclosed with aluminum cowling which extends as far back as the turtle-deck on the top, and the rear landing gear braces at the bottom. The part of it forward of the fire wall is easily detachable.

The capacity of the gasoline tank in the center section is 13 gallons; an additional tank of 8 gallons is optional, and is installed in front of the dash board in the fuselage. The oil tank, which is in the engine compartment holds 3 gallons.

The flying qualities of the plane have been reported as highly satisfactory by many pilots who have flown and stunted it. This fact will contribute much towards making it a favorite with both the experienced and the "to-be" pilots. The stability is automatic to a great degree, yet the plane responds readily to the controls. It has been flown for extended periods with hands off the controls. It may be put into the most daring stunts with ease; in taking turns, the plane banks by itself and levels out again with the use of rudder only.

Specifications

Wing span	30 feet 9 inches
Length	18 feet
Height	7 feet 3 inches
Wing area	135 square feet
Wing chord, maximum	63 inches
High speed (75 h.p)	115 miles per hour
Landing speed	43 miles per hour
Climb	700 feet per minute
Range	400 miles
Weight empty	650 pounds
Weight loaded	1,100 pounds

NEW CHAMPION TYPE AE-9 SPARK PLUG

FOLLOWING two years of exhaustive tests the Champion Spark Plug Co. announces a new aviation spark plug. It will be known in the trade as the AE-9. Modifications of the standard design are also available for unusual types of aviation engines.

The new spark plug is of special design, considerably different from the Champion Company's automobile spark plugs.

In the AE-9 entirely new principles of core design have been incorporated. In place of the standard straight top with the electrode cemented through the plug's entire length, the AE type uses two pieces of insulation. The first is a primary core with sufficient electrical clearance at the top to be safe. The second is a protecting and covering dome of sillimanite which encloses the primary core and, in addition, adds to its insulating length.

This dome is of a structure which makes it practically unbreakable. Ordinary wrench slips, such as are rather common in installing plugs in aviation engines, will not break it. The dome is so heavily constructed of the sillimanite that it is necessary to hit it a severe, direct blow with a hammer to cause breakage.

The plug has the characteristic Champion two-piece design which permits the unit assembly of core and bushing to be removed if desired. The entire structure is so tied together that all danger of parts separating is eliminated.

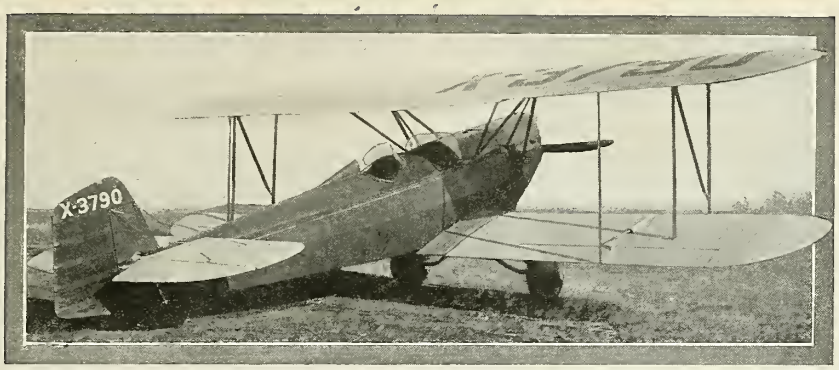
JAEGER STOP WATCH

THE Jaeger 8-day chronograph stop-watch, manufactured by the Jaeger Watch Company, of New York and Geneva, Switzerland, is designed to be mounted on the instrument panel of airplanes, speedboats, racing cars or other machines where the rate of climb, speed, acceleration, etc., can be timed over a predetermined distance in fifths of a second.

The chronograph hand indicates on the outside scale which is calibrated in fifths of a second. The chronograph feature with the minute totalizer is quite useful by pilots of mail and commercial planes in clocking their time spent at landing fields, refilling at airports and the rate of speed between cities.



The Jaeger stop watch for airplanes.



The COMMAND-AIRE

The COMMAND-AIRE was designed and built in the belief that there was a large number of people anxious for a plane that could truly be classified as "A better Ship." The volume of orders received for the COMMAND-AIRE has more than justified this belief.

Features That Make The "COMMAND-AIRE" the Greatest Airplane Value Ever Offered at the Present Price

1. Performance unexcelled by any other plane equipped with OX-5 motor.
2. Nose radiator, utilizing otherwise parasite resistance.
3. Improved split axle type landing gear with large wheels.
4. Fire wall of aluminum sheets with asbestos sheet beween.
5. Metal floorboards, lighter than wood and fireproof.
6. Genuine Chase upholstering.
7. Extra large and comfortable cockpits.
8. All metal parts such as tubing, struts and fittings of chrome molybdenum steel.
9. Consolidated instruments mounted under plate glass and indirectly lighted as on finer automobiles.
10. Navigation lights connected ready for use.
11. Radiator shutters operated from pilot's cockpit for winter flying.
12. Stabilizer adjustable from pilot's cockpit.
13. Macwhyte streamline wires.
14. Plywood leading edges on wings.
15. Increased visibility through elimination of center section wires and braces.
16. Satin like finish through use of best fabric and Berryloid lacquer.

PRICE $2950
at Little Rock
(Subject to Change)

If you expect to own a COMMAND-AIRE this season, your order should be placed without delay.

TO DEALERS—

On account of increased production, we are in a position to contract with a few more reputable dealers--wire for details.

Arkansas Aircraft Corp'n.
Little Rock Arkansas

INSPECTION OF AIRCRAFT TUBING*

By HORACE C. KNERR

Consulting Metallurgical Engineer, Summerill Tubing Co.

IN the manufacture of seamless steel tubing such as is used in aircraft construction, the first operation is to pass the hot billet through a piercing mill, from which it emerges as a short, crudely formed tube or hollow billet. This is subjected to one or more stages of hot rolling over a rod, during which it is reduced to about 3 in. diameter, ¼ to ⅜ in. wall, 15 ft. or more long.

Subsequent stages of manufacture consist in cold drawing through a die and over a mandrel to successively lighter walls and smaller diameters. The tube must be annealed after each pass to remove the hardness produced by cold work, and must be pickled after each annealing to remove scale or oxide. After pickling and rinsing the tube is coated inside and out with a lubricant, preparatory to the next cold pass. A tube of thin wall and small diameter may go through this series of operations as many as 25 times before reaching its final dimensions.

As the tubes are elongated on each passage through the die, they soon become too long for the draw bench or annealing furnace, and must be cut in two. These halves again are drawn and in their turn are cut in two when they reach a limiting length. From a single original billet weighing 75 to 100 lbs., as many as a dozen or twenty tubes of thin wall may therefore be produced.

Many lots of tube in different stages of manufacture are passing through the cold drawing mill at one time. The lots are handled in bundles, consisting of a few dozen to a few hundred tubes, according to their size and weight. Each bundle is identified by a tag and a job card, on which its progress is recorded. The utmost care is given to the segregation of tubes of various types or analyses of steel in their progress, but in spite of this, human fallibility sometimes results during the many handling operations, in placing a tube of one analysis in the wrong bundle, after which it loses its identity. This chance is not confined to the tube manufacturer's plant, but exists also in the user's shops and stock rooms.

The aircraft industry, including the Army, Navy and commercial builders, have at present standardized on seamless tubing in three types of compositions, as listed below:

Specifications for Standard Aircraft Tubing

	Mild Carbon	3½ Per Cent Nickel	Chrome-Molybdenum
Specification—			
U. S. Army Number	57-180-1	———	57-180-2
U. S. Navy Number	49-T-1	49-T-2	———
S.A.E. Steel Number	1025	2330	4130 X
Chemical Composition—			
Carbon	0.20 to 0.30	0.25 to 0.35	0.25 to 0.35
Manganese	0.50 to 0.80	0.50 to 0.80	0.40 to 0.60
Phosphorus (max.)	0.045	0.040	0.040
Sulphur (max.)	0.050	0.045	0.045
Nickel	——	3.25 to 3.75	——
Chromium	——	———	0.80 to 1.10
Molybdenum	——	———	0.15 to 0.25
Minimum Physical Properties—			
Tensile strength	55,000	125,000	95,000
Yield point (dividers)	36,000	100,000	60,000
Elongation in 2 in., per cent	22	12	12
Heat treatment	normalized or as drawn	quenched and tempered	normalized or as drawn

Because of its satisfactory fabricating qualities, and its excellent physical properties either as cold drawn, slightly tempered after drawing, normalized, or oil quenched and tempered, chrome-molybdenum steel is finding wide application.

The two alloy steels do not differ widely in their physical properties, either as drawn or after like heat treatments. If one or more tubes of one type became mixed with tubes of the other type, and heat-treated accordingly, the properties obtained, while not the best, would not cause danger. Moreover, no trouble should arise from mistaking an alloy steel tube for one of mild carbon steel, since its physical properties would be superior.

But if a tube of a mild carbon steel became mixed with a lot of either 3½ per cent nickel steel or of chrome-molybdenum steel, serious results might follow, since its strength would be much less than that of the alloy steel for which the structure was designed. Therefore it is imperative to apply a final test to *each individual tube* in a lot of alloy steel of either type, to insure that no mild carbon steel tube is present. (Of course, the same situation exists with tubing, bar stock and finished parts in the aircraft manufacturer's plant.)

There is a simple, convenient and reliable test for the identification of nickel steel. This consists in putting a drop of 50 per cent nitric acid on the cleaned surface, soaking up the drop after reaction is completed (in about thirty seconds) on a sheet of filter paper or white blotting paper, and applying to the wet spot on the paper a few drops of a di-methyl-glyoxime solution. This is made of 1 gm. di-methyl-glyoxime, 60 cc. of 80 per cent acetic acid, 30 cc. concentrated ammonia and 10 gm. ammonium acetate. If nickel is present the spot will turn strawberry pink; in the absence of nickel, the spot is reddish brown. The indication is quite distinct and positive when the test is properly performed, and a large number of pieces can be tested in a short time.

Unfortunately, no simple, rapid and thoroughly reliable chemical test seems to be available for identifying chrome-molybdenum steel.

Consideration has therefore been given to the hardness test as a means of identification. Neither the Brinell nor the scleroscope test is suitable for use with thin-walled tubing, but the Rockwell hardness test is well adapted to the purpose.

Preliminary experiments showed that no clear distinction could be drawn between the Rockwell hardness of mild carbon and chrome-molybdenum steel tubes, as they came from the mill after drawing. However, after normalizing, i.e., heating above the critical range and allowing to cool in the air with free circulation, chrome-molybdenum steel tubes of aircraft sizes show a Rockwell hardness of 90B or over, while mild carbon steel gives a hardness below 80B. (When it is not practicable to normalize the whole tube or its end, a sample may be cut, normalized in a small laboratory furnace and tested.)

Nine mild carbon steel tubes and nine chrome-molybdenum steel tubes were tested in three diameters representative of aircraft sizes (½, 1 and 1¾ in.), each diameter in three wall thicknesses (B.W.G. 20, 16 and 11; respectively 0.035, 0.065 and 0.120 in.). Tubes were taken at random from stock, suitably numbered and cut into sections 10 in. long.

A series of eighteen specimens, as above mentioned, was normalized at each of the following temperatures: 1400 deg. Fahr., 1490, 1580 and 1660. The specimens were held at temperature for 15 min., withdrawn individually and supported horizontally about 2 ft. above the floor so as to permit free circulation of air. They cooled to blackness within 1 min. or less. The tubes were not tempered after normalizing.

Some very light scale was produced during cooling. The scale on the chrome-molybdenum steel peels off freely, while that on the carbon steel adheres. This serves as a fair but not very positive distinction. It is important to remove this scale both inside and out at the point tested.

Rockwell hardness tests in triplicate, using ⅛-in. ball, 100 kg. load, were taken on all specimens, including a set from the tubes in the original condition (as delivered by the last drawing bench). Individual readings on any specimen usually fell within plus or minus 2 points of the average.

For thin-walled tubes, a special anvil was used, consisting of a rounded head supported on a curved arm in such a way that the end of a tube may be slipped over the head, which then supports the wall from the inside. The head has a radius of about ¼ in., but is slightly flattened on top, so that it makes the least possible indentation on the inner surface of the tube. Another special anvil for small tubes consisted of a piece of hardened drill rod, ⅛ in. diameter, ½ in. long, extending horizontally from an upright arm. Readings taken with these anvils on a test block of known hardness are two to five points lower than with a flat anvil, due to a scarcely perceptible indentation made by the anvil on the under side. However, the results on such special anvils are consistent, so that a correction can be made. No other equally practicable method was found to test thin-walled tubes.

No specimen of the annealed carbon steel lot showed a hardness exceeding 80B. Three specimens of annealed chrome-molybdenum steel lot showed a hardness less than 90B, which were set aside as doubtful for further investigation.

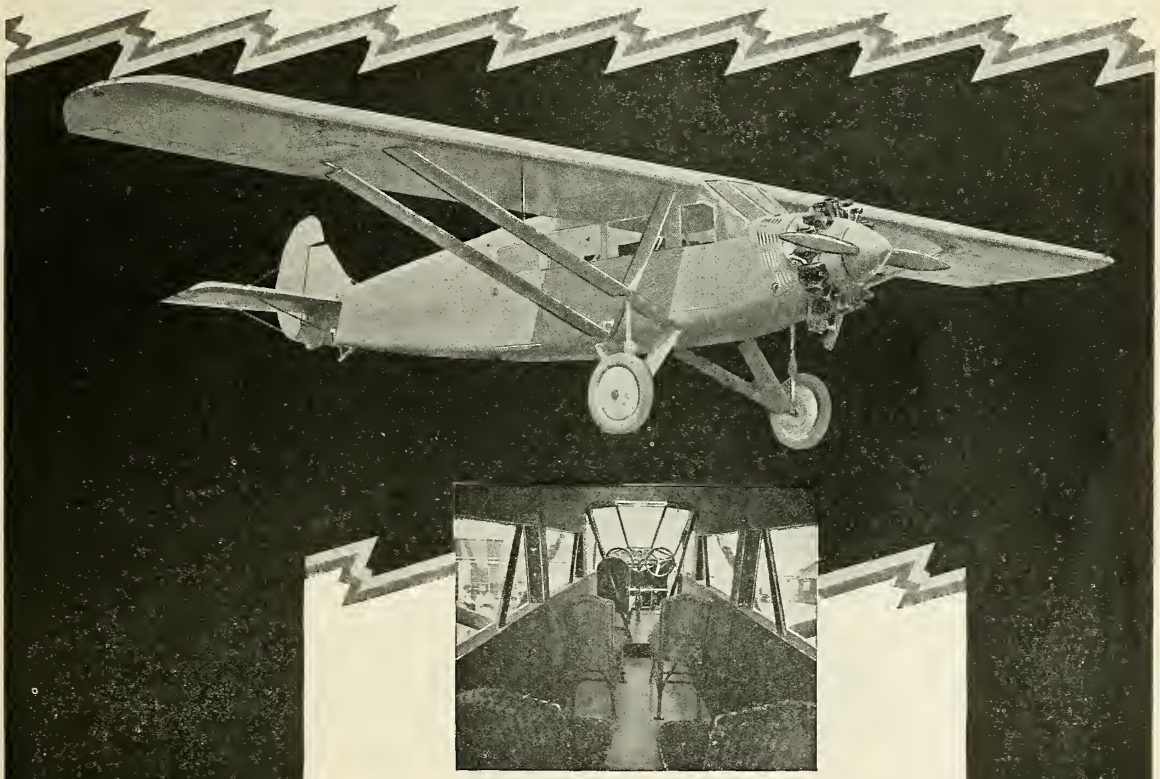
No consistent relation between hardness and tensile strength of normalized tubes was observed, except the following general ones: Rockwell hardness over 90B corresponds to

(*Continued on next page*)

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The Limousine of Air Travel



TYPE 6000

A De Luxe Monoplane combining Pullman Car comfort in air travel with proven performance and dependability.

CAPACITY—2 pilots, 4 passengers and 150 lbs. baggage, or pilot and 1000 lbs. pay load.

CONTROLS—Duel "dep" (side by side). Separate brake control pedals.

CABIN—All six occupants face forward with full front and side vision. Blue velour upholstering. Four removable wicker chairs. Windows, plate glass, raised and lowered by auto type crank lifts; heater; two full width doors.

LIGHTS—Instrument; navigation. Compartment arranged for landing lights.

POWER PLANT—200 H.P. Whirlwind J5C motor.

PERFORMANCE WITH NORMAL FULL LOAD. High speed; 126 mph. Landing speed, 57 mph. Normal cruising range (78 gal. fuel) 675-725 miles.

Complete specifications and details of equipment on request.

Travel Air Manufacturing Co.

Wichita, Kansas

(*Continued from preceding page*)

tensile strength over 95,000 lb. per sq. in. Rockwell hardness under 80B corresponds to tensile strength under 75,000 lb. per sq. in. This, however, is a check on the satisfactory strength of normalized chrome-molybdenum.

When the mechanical properties were plotted against normalizing temperatures for tubes of a given diameter, little effect on the hardness or tensile strength values was found within the range of 1490 to 1660 deg. Fahr. At 1400 deg. Fahr. there is a general tendency for all values to fall. This temperature is too low for satisfactory results. Any temperature between 1500 and 1600 deg. Fahr. would appear to be satisfactory for normalizing, although narrower limits could readily be maintained.

In general, hardness and strength tend to increase with decreasing wall thickness, but there are numerous exceptions to this rule, due perhaps to slight variations in composition, or other factors. Within the range of ½ in. to 1¾ in. at the various gages and temperatures, diameter has little effect on the strength of tubes of either analysis under test.

Chemical analyses of each tube under test were made. The carbon steel tubes ranged from 0.17 to 0.31 per cent carbon, and each gave negative results in a qualitative analysis for chromium, molybdenum, nickel, vanadium and tungsten.

It is significant that one tube, namely 1¾ in. by 0.120 in., of those supposed to be chrome-molybdenum steel tubes, contained only 0.06 per cent chromium and 0.07 per cent molybdenum and was therefore defective in composition. The four specimens from this tube showed inferior physical properties, and Rockwell hardness in the neighborhood of 80B. The Rockwell test therefore served to distinguish this tube from the good ones.

Another tube of the chrome-molybdenum steel lot showed erratic Rockwell hardness, although the tensile properties were excellent and the composition normal. Under the Rockwell inspection test this tube would have been withheld, subject to further test or other disposition by the manufacturer, and therefore without risk to the purchaser.

Conclusions

The results indicate that, within the range of diameters from ¼ in. to 1¾ in., and thicknesses from 0.015 in. to 0.120 in.:

1. After normalizing, that is, allowing to cool freely in air, from a temperature between 1490 and 1650 deg. Fahr., tubes of 4130X steel may be distinguished from tubes of 1025 steel which have been mixed with them by means of a Rockwell hardness test. The former will exceed 90B, while the latter will be less than 80B. Any tubes of intermediate hardness may be regarded as doubtful, subject to further verification, or rejected.

2. Without normalizing, the Rockwell hardness does not clearly distinguish between tubes of these two steels.

3. Rockwell B hardness is not directly proportional to tensile strength for either type of steel, but if the hardness is above 90B, after normalizing at 1490 to 1660 deg. Fahr., the tensile strength of 4130X tubes is above 95,0000 lb. per sq. in.

4. The normalizing range is wide, variations in temperature between 1490 and 1660 deg. having little effect on hardness or tensile values. A temperature between 1525 and 1575 deg. Fahr. is to be preferred, so that scale will be a minimum.

5. The test is rapid, inexpensive and can be performed by a relatively unskilled operator. Errors, should any occur, are likely to cause the rejection of good tubes due to low hardness readings, rather than the acceptance of inferior tubes.

6. This test is not suitable for separating chrome-molybdenum steel tubes from tubes of high carbon or other alloy steel, as these would probably have similar hardness values after normalizing.

WILLIAMS-HUSKY WRENCH SETS

J. H. WILLIAMS & CO., Buffalo, and the Husky Wrench Company, Milwaukee, manufacturers of high grade wrenches, have effected a reciprocal sales arrangement which enables them to supply the trade with a unique line of combination wrench sets. Each set is composed of Williams' "Superenches" and "Husky" socket wrenches.

This arrangement enables each company to merchandise in combination sets the other's quality open-end, or socket wrenches. It is made for sales purposes only and is limited to the items constituting the sets.

ALL METAL *but the tires*

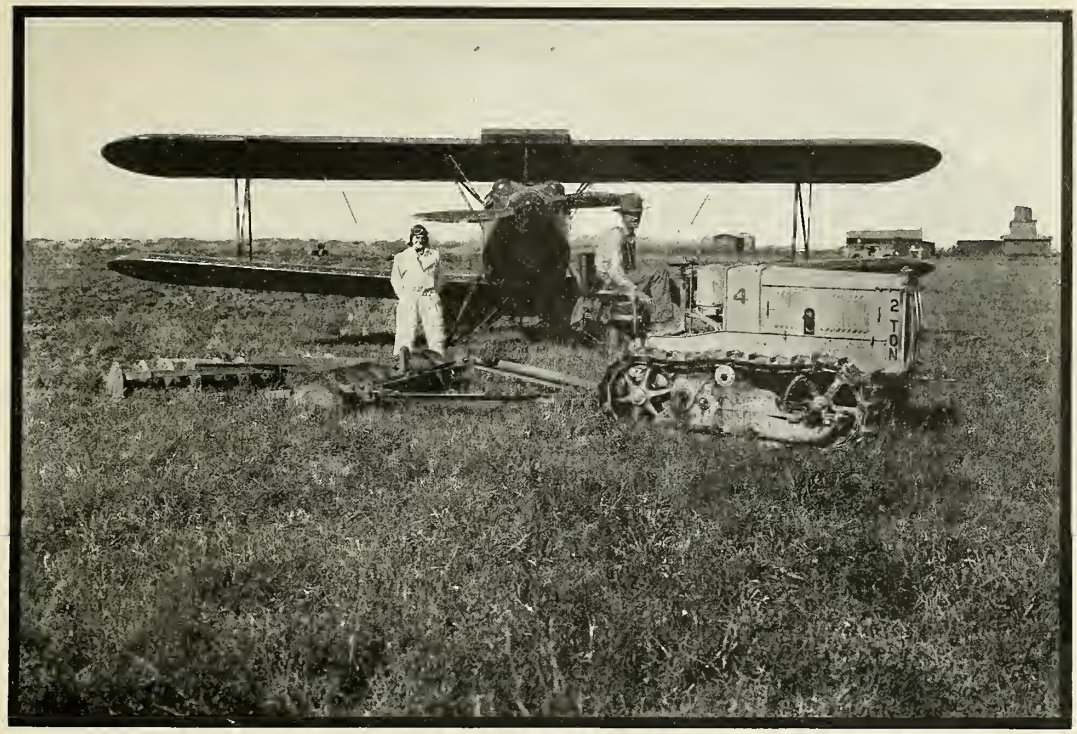


Patented and Patents Pending

Model "C", OX5 Motor, $2950

LENERT AIRCRAFT CO.

Pentwater Michigan



Pretty Smooth

WHEN the "Caterpillar" Tractor finishes with this field, it will be level, smooth and hummock-free!

New airports are swiftly and economically built where "Caterpillars" furnish the power. Wide tracks to ride the soft spots—working where soil and weather are unfavorable—plowing, leveling, disking, rolling—"Caterpillars" save men, money, minutes!

The picture shows the start of work on Orange County's (California) new 160-acre airport

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Say you saw it in AERO DIGEST

WESTERN NEWS

NATIONAL AIR RACES

MINES FIELD, Inglewood, (Los Angeles), will be the scene of the 1928 National Air Races and International Aeronautical Exposition to be held September 8-16 under the auspices of the California Air Race Association.

Besides the annual national races at Los Angeles, five big races will be flown to Mines Field—a non-stop transcontinental race for all type ships from New York, finishing September 13 (cash prizes $22,500 plus trophies); an air derby from New York for Class A, B and C ships, finishing September 10 (cash prizes $40,000 plus trophies); an international race for all type ships from Windsor, Canada, finishing September 12 (cash prizes $10,000 plus trophies); a Pan-American race for all type ships from Mexico City, finishing September 11 (cash prizes $10,000 plus trophies); a California air race for Class A and B ships from San Francisco and Oakland, finishing September 11 and 12 (cash prizes $2,000 and $3,000 plus trophies).

Three days, September 14, 15 and 16, will be devoted to the national races, which include relay, free-for-all, speed and efficiency races for civilian and military planes, and parachute jumping contests. Fliers in these races will compete for $125,000 cash prizes plus trophies.

Dudley M. Steele, chairman of the contest committee, invites interested fliers to send for the official program, rules, regulations and entry blanks, addressing the California Air Race Association, 1101 A. G. Bartlett Bldg., Los Angeles, Calif.

CALIFORNIA AIR NEWS

C. H. HOLMES, who for more than five years has been interested in aviation in California, has been appointed assistant director of sales and general advertising manager for the Prudden-San Diego Airplane Co.

He has been associated with many of the leading advertising concerns of Southern California, but of late has directed his efforts toward aviation, both from the sales and advertising angle.

AIR express service was inaugurated April 15 by the American Railway Express and Pacific Air Transport, operating between Los Angeles and Seattle, serving Bakersfield, Fresno, Oakland, San Francisco, Medford, Portland, Tacoma and Seattle.

The American Railway Express, by the Western Air Express, also began on the same day service to Cheyenne, Denver, Colorado Springs and Pueblo.

MADDUX AIR LINES inaugurated on April 14 daily passenger service between Los Angeles and Oakland and San Francisco, with three 12-passenger Ford trimotored monoplanes. Thirty distinguished guests were passengers on the inaugural trip.

Two stops are made on the line—at Bakersfield and Fresno. Daily schedule of the line is given in the Air Route Schedules section of this issue.

SELMA dedicated its new airport, Eagle field, on March 31 with a large gathering of commercial and military planes for the two-day celebration.

The new field is named in honor of Capt. A. I. Eagle, of Crissy Field, San Francisco, who flew to the field leading five Douglas Army planes. The Navy was represented by Lieut. J. E. Dyer of the San Diego Naval Air Station and a number of navy planes. Commercial planes from fields in the San Joaquin valley brought many fliers and passengers.

The field is located five miles south of Selma, just halfway between San Francisco and Los Angeles, and is said to be the largest field in the San Joaquin valley.

The American Legion, Selma Aero Club, Chamber of Commerce and other civic organizations joined in securing and preparing the field. A. J. Little and Ernest J. Nielsen headed the airport committee which arranged the celebration. Miss Fern Grimes was proclaimed the Selma Queen.

UNDER a new production schedule approaching a plane a day the Mahoney Aircraft Corporation are operating their San Diego factory to capacity in an effort to fill advance orders for their planes before the summer rush begins.

Effective at once this company is also raising the price of their Ryan Brougham to $12,200, steel propeller $300 extra.

A MIGHTY air fleet, totalling 325 fighting, bombing, scouting and patrol planes, will wing its way over San Diego August 16 as part of the dedicatory ceremonies of Lindbergh field, the city's new airport.

The flying field is being constructed at a cost of more than $700,000 and will be an AAA port, having ample facilities for every type of craft.

THE first annual Western Aircraft Show, sponsored by the Junior Chamber of Commerce, was held at Mills Field, San Francisco, April 11-15. In addition to the exhibits of aircraft, there were daily flying exhibitions by Army, Navy and civilian planes.

The presence at San Francisco of the *Saratoga*, the *Lexington*, and the *Langley*, from which were given demonstrations of the launching of airplanes, added to the interest of the show.

MEXICO-WASHINGTON NON-STOP FLIGHT

CAPT. EMILIO CARRANZA, the Mexican Lindbergh and perhaps the best known aviator south of the Rio Grande, officially inspected his new plane at the factory of the Mahoney Aircraft Corporation of San Diego on April 18th. He was accompanied on his tour of inspection by Capt. Luis Lopez of the Mexican army, S. B. De Reachi, John Nulsen, general manager of the Mahoney company, and S. C. Breder, sales manager.

Capt. Carranza expects to take delivery of his plane May 15th and after flying to Mexico City via El Paso he will fill the tanks and start on his "good will" non-stop flight from Mexico City to Washington, D. C., as a return courtesy flight to Col. Lindbergh.

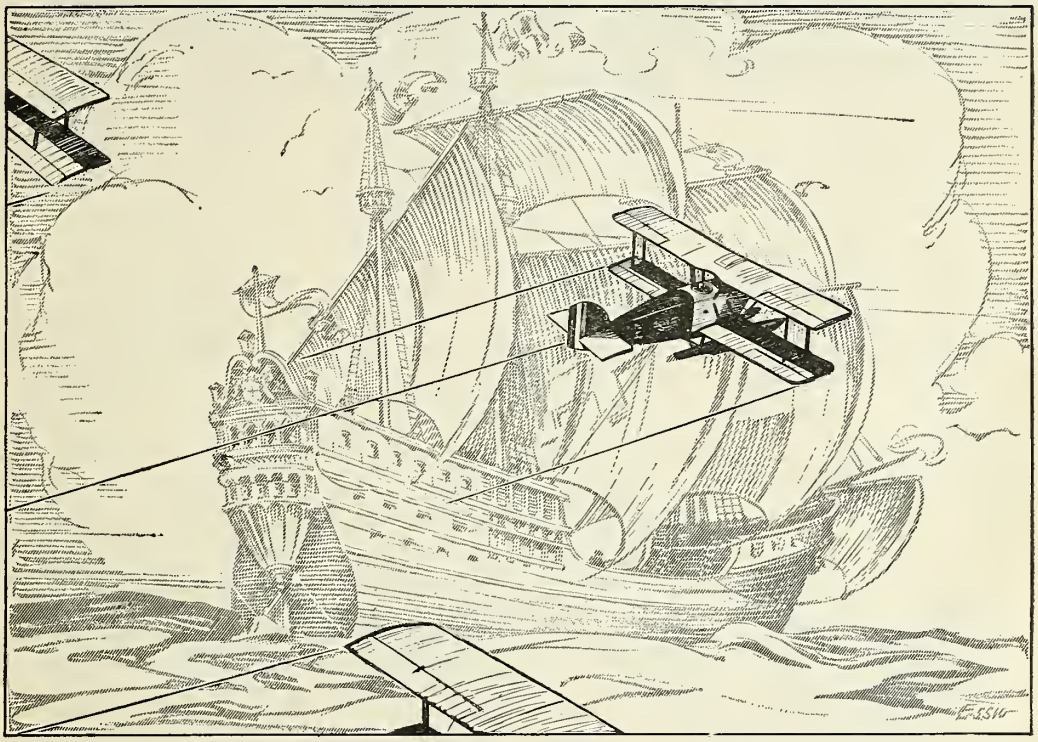
Capt. Carranza's plane, a duplicate of the new Ryan Brougham recently delivered to Col. Lindbergh, will be provided with tanks sufficient for 50 hours of continuous flying. The plane was purchased for him by popular subscription in Mexico City.



S. B. De Reachi, Capt. Luis Lopez, Capt. Emilio Carranza, John C. Nulsen and S. C. Breder after inspecting Carranza's plane at the Mahoney plant.

D O U G L A S

F I R S T A R O U N D T H E W O R L D



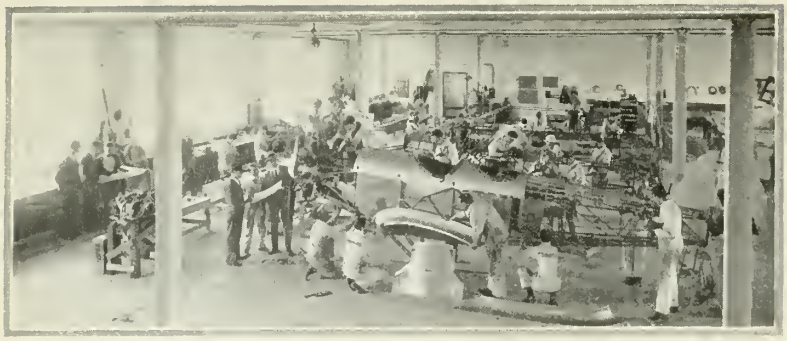
The Spirit of Ferdinand Magellan lives today in Douglas. Not alone in the successful circumnavigation of the world thru the air for the first time---Douglas Engineers' early contribution to the advancement of Aviation---but in the Spirit of Adventure that leads men forward, ever seeking the land that lies just beyond the horizon.

Douglas engineers are continually reaching out into the unknown realms of Aviation, seeking to find another new refinement that will add materially to the more rapid acceptance of Aviation as the most popular mode of transportation.

Thus, in Douglas planes are incorporated, not only those time-tested fundamental principles of airplane design, but the Douglas-developed improvements resulting from tireless experimentation. The product of merciless testing and continual change until the exacting demands of perfection are satisfied in full, such improvements serve to inscribe again, in the pages of Aviation's history, another chapter of increased reliability and dependable performance — by Douglas.

T H E D O U G L A S C O M P A N Y

Santa Monica *California*



Interior of the Thunderbird Aircraft Company's factory at Glendale, Calif.

CONTACTS

By Frank E. Samuels

WHILE at Clover Field I had the pleasure of seeing the test flight and demonstration of the little two-place sport plane, the Andiz Monoplane. Bob Lloyd, our well-known instructor and pilot, took it up on its first flight and praised its performance highly. The little ship is quite an innovation from the usual run of sport planes, being very low to the ground, long, narrow and of a rakish type, after the style of a high speed automobile. With its Anzani engine its speed is estimated at about a 100 m. p. h.

I ALSO saw the little Cessna monoplane which is built at Wichita, Kansas, and is represented on the West Coast by the Beacon Airways of Fresno, Calif. Just as I arrived on the field, pilot Hettringer was about to take off for Fresno. With him was president Hemmingway of the Beacon Airways and Paul A. Michaelson, vice president and Los Angeles district manager. The quick take off and climb, along with the speed that the little ship developed in a short distance, speaks well of it for passenger hauling and business trips.

JIM WEBSTER, at Rogers Field, is more than pleased with his new Stearman demonstrator. As Jim says, "It is turning out even better than I was led to believe it would and is proving its passenger carrying capacity and ability, not only on long trips, but right here on the field where it is kept in the air almost continuously."

WALLACE BEERY, the movie star, visited the field during the time I was at the airport, in his new Whirlwind-motored Travel Air. Wallace has Dick Ronaldi, the boy pilot, for his private pilot, although Wallace handles the stick himself and has become quite a pilot.

BETWEEN Ford-Stout all-metal ships of the Maddux Airline, the Ryan Broughams of the Mutual Aircraft, distributors of these ships for B. F. Mahoney, both of which make the airport their headquarters, and the number of eastern planes that drop in on the field during their stay in California, plus their own planes, Rogers Airport is always a busy, interesting place.

WALTER HAMILTON, vice president and chief mechanic of the Aero Corporation of Calif., reports the motor overhaul and repair department as doing more business than it can handle with one shift of mechanics, and that on May first they will start a twenty-four hour service. Pilots will be able to bring in their ships, early in the evening and fly them away the next morning. They are taking care of all makes of engines.

ACE BRAGUNUER, old time pilot, is having lots of fun barnstorming through Arizona and Montana in his new Mahoney Ryan Brougham. Ace reports passenger carrying at its best—capacity business everywhere.

VANCE BREESE showed the world what a real pilot will do in case of a bad accident when on April 15th, while a thousand feet up over San Francisco bay with six passengers in the cabin of his monoplane, the propeller snapped off causing such a vibration that it tore the engine loose from its mount, dropping it into the bay. With the six passengers, one of them a child, tossing about in the cabin screaming with fear and the ship unbalanced by the loss of its engine and going through erratic gyrations, Vance managed to keep it from turning completely over and made a side-slip landing on the side of a hill, without injury to his passengers or himself.

Vance, the pilots and your friends in Southern California have requested me to send you their congratulations and appreciation of the wonderful feat that you accomplished.

STANLEY SHORT, of Short's Airport on Main Street, is commencing to receive returns for the hard work he has put in during the past three years. He is building up a nice clientele of students and his passenger carrying business is better than he ever expected it to be. He has secured the services of S. T. Hasvold, formerly with Western Air Express, as contact and publicity man, and Mr. Cogle as field manager. Everyone wishes Stanley the best of luck.

AT Glendale Airport we had the pleasure of reading telegrams from Washington saying that the Kinner K5 radial air-cooled engine had passed the Department of Commerce test with a 100 per cent record in the 50-hour run. At 1720 r. p. m. it gave a uniform rating of 101 h. p. and at 1800 r. p. m. a uniform rating of 112 h. p. We understand that the Kinner engine is the first American air-cooled engine that has made the Department of Commerce test. Mr. Kinner will go on a production schedule of one a day inside of three weeks and expects to increase production to two a day within six weeks.

WE also had the pleasure of seeing the first test flight of the new Kinner monoplane before it was delivered to Dr. T. C. Young. To say that the test flight was a success is putting it mildly. Mr. Kinner piloted the plane on the first flight. Motored with a Kinner 100 h. p. engine it seemed to leap into the air and climb. It landed with a run of not more than fifteen feet after it touched the ground. Dr. Young has got a plane that will give him a lot of fun and recreation and with its folding wings he can park it in a garage.

WHILE in Glendale we stopped in at the Thunderbird plant. A great amount of activity is going on there and a lot of new machinery has been installed. Lieut. Paul S. Smith, World War Ace, has been engaged as test pilot. Three planes in different stages of construction were on the floor, in one of which they were installing a new Hallett 150 h. p. air-cooled engine. This particular plane is to be used as a test plane by Mr. Hallett. Ted Woolsey informed us that they are now on a production basis of one a week and that within sixty days they will be turning out three a week and then won't be able to catch up with their orders. Ted always did turn out a good plane and it is a pleasure to see a line up of them on the Glendale Field.

JACK LAASS, chief pilot for the Mutual Aircraft Corporation of California, completed a record mapping job for the Fairchild Aerial Surveys when he flew a standard Ryan Brougham at an altitude of 18,000 feet for 5½ hours carrying complete mapping equipment and operator. This type of cabin plane has a service ceiling of over 18,000 feet and is uniquely adapted to this type of work. It required a little over an hour to attain this altitude.

THE West Coast Aviation Service of Long Beach is handling the entire output of Flying Togs, Inc., of Inglewood, Calif. A line of aviation jewelry, including rings, pins and bracelets, also boots and goggles, are carried. The company has a contract with Barber and Baldwin for aviation insurance on the West Coast, with the North American Co. for accident and life, and also with the Lincoln Life Insurance Co. A number of representatives are on the road, soliciting business from the airports and flying fields, and report business as excellent.

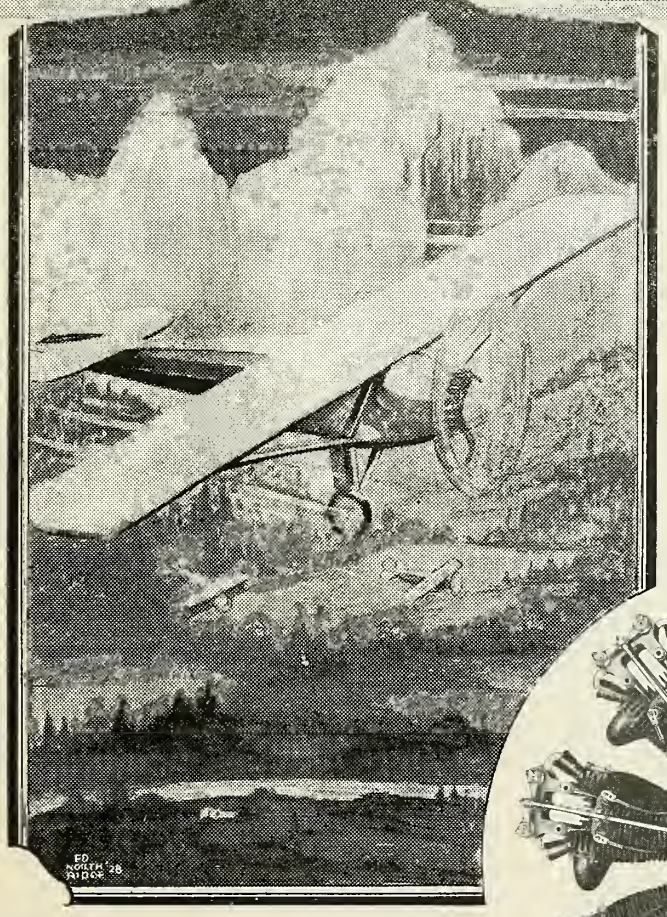
COUNT BONMARTINI, who recently purchased a Ryan Brougham from the Mahoney Aircraft Corporation of San Diego, expects to use the plane on "Rome,"

(*Continued on next page*)

RYAN-SIEMENS ENGINES

Consistent Performance

RYAN-SIEMENS ENGINES

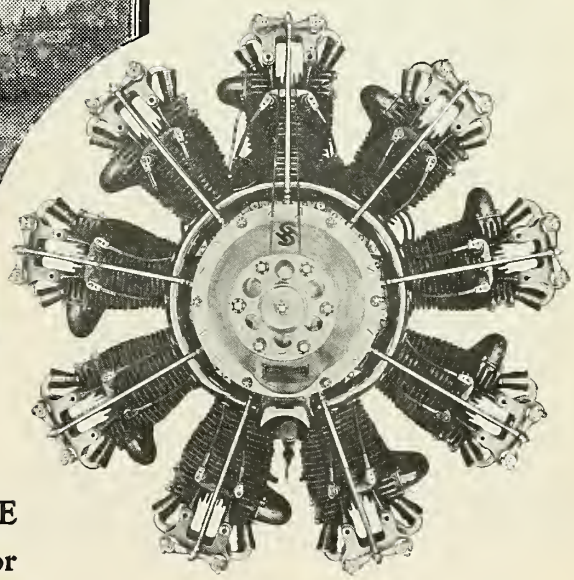


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These engines [known in Europe as the Siemens-Halske]. . . are a sturdy simple type, thoroughly proven over a period of thirteen years and perfected by 7,000,000 miles of actual flying.

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An ECONOMIC Power Plant Serving Commercial Aviation

Prompt Delivery in Any Quantity

RYAN AERONAUTICAL CORPORATION

San Diego ~ California

Say you saw it in AERO DIGEST

(*Continued from preceding page*)

Italy's new commercial airport, which, when completed, will be one of the largest in the world. Bonmartini, who is general manager of one of the largest civilian companies operating from the airport, expects to place an order for three more planes before the end of the summer for passenger and sightseeing work.

J. B. ALEXANDER, general manager of the American Aircraft Corp., is at the factory of the Fairchild Aviation Corp., Farmingdale, N. Y., from whence he will ferry another Fairchild "All Purpose" cabin plane to the Los Angeles airport. We were sorry not to be able to accept J. B.'s invitation to make the trip with him but hope to make the trip in the near future.

THREE Ryan Broughams are now being prepared to try for a new world's endurance record before June 1st. Tex Rankin of Portland, Oregon, will take off from a beach between Portland and Seattle; Joe Hart, backed by the citizens of Chickasha, Okla., will make a try for that city; and Al Henley, Dole flight contestant who recently landed his Brougham in a street with 525 gallons of gasoline and a relief pilot on board without damage to the plane, will attempt to break the record from Fort Worth, Texas.

THE Bach Aircraft Co. is contemplating moving into larger quarters in the near future, as orders are coming in so fast for their Air Yacht that they are cramped for room. The third of the ships for the West Coast Air Transport company is just about finished and will be ready for delivery in the near future. A few minor improvements are being made on each new ship.

BOB BLAIR of the Frank Baker Aircraft, made a trip in the Buhl Airsedan to the Western Aircraft Show, held at Mills Field, San Francisco, April 11th to the 15th, and reports the show as being the biggest aviation event ever held on the West Coast. He estimates that over 200,000 people attended the show on the last day, Sunday. He reports doing business all through the show, closing a number of contracts for Airsedans for early delivery.

MR. MENASCO, of the Menasco Motors Company, informs us that he has sold out his entire output for 1928. He has moved his plant into a large, well lighted factory building in the southern section of the city, has installed all necessary machinery and has a force of high class mechanics getting the plant ready for a big production campaign.

THROUGH SAN JOAQUIN VALLEY in an AIRSEDAN

THROUGH the courtesy of the Frank Baker Aircraft, and by kind invitation of Bob Blair, one of the firm, who was our pilot during the trip, in a brand new Buhl Airsedan, I had the pleasure of meeting a lot of good fellows witnessing the opening and dedication of the Selma Municipal airport during a five-day demonstrating trip through the San Joaquin Valley.

Taking off from the Frank Baker field at Culver City at 8:50 a. m., Saturday, March 31st, we dropped down into the new municipal airport at Selma after two hours run. We were met by a committee from the Legion of Honor, who with a committee from the Selma Aero Club, had charge of and were accountable for Selma having the largest and one of the best airports in San Joaquin Valley.

The Army was represented by planes from Crissy Field, San Francisco; the Navy by two Voughts from North Island, San Diego; the Reserves flew planes from Clover Field, Santa Monica and Griffith Park; and commercial planes came from as far as San Diego and San Francisco. The Buhl Airsedan was the center of attraction during the two days, as it was its first appearance north of Los Angeles.

Monday morning we headed for Visalia where we remained for the annual meeting of the Visalia Chamber of Commerce on Tuesday evening, and headed home Wednesday after visiting several neighboring towns. It was a wonderful trip with good results for all concerned. Bob sold an Airsedan and demonstrated the plane to many interested people at each port of call, and I—well, is there anyone who can stop at the San Joaquin Valley towns and not enjoy themselves?



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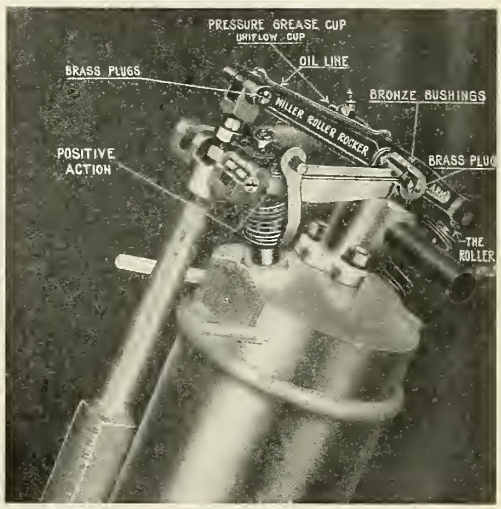
Saves 15% on gas, adds 20 to 50 rev's to the motor speed, takes all noise from the overhead, greatly reduces friction in pins, bearing surfaces, valve guide and pull rod. Over one thousand sets now in use on OX's in planes, speed boats and racing cars. Standard equipment on Alexander Eaglerocks and now being adopted by other leading manufacturers.

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NORTHWEST AIR NEWS

By F. K. Haskell

PACIFIC Air Transport, air mail contractors operating between Seattle, Portland and Los Angeles, carried during March 7,901 pounds of mail, 200 pounds of express and 91 passengers over 26,958 miles.

With an air mail route system totaling 3,017 miles, Boeing Air Transport system and Pacific Air Transport flew 179,187 miles in March according to a report issued by W. G. Herron, vice president in charge of traffic.

More than 6,000 miles are flown daily on the Pacific Coast and transcontinental routes of the two concerns, more than a third of the total of 15,000 miles flown daily by all mail planes operating in the United States.

Boeing Air Transport carried last month on the transcontinental route 51,000 pounds of air mail and 1,500 pounds of express. One hundred and twenty-two passengers were carried 105,117 miles.

REGULAR airplane passenger service between Portland and Yakima, Wash. will be started May 15th by Tex Rankin with two round trips daily. Rankin will use his two Ryan four-passenger broughams on the run. They will leave Portland at 7 a. m. and 3 p. m. and make the trip in two hours. Yakima departures will be at the same hours.

Arthur Walters will pilot the plane operating from Yakima and Rankin and Frank Anderline will alternate in piloting the plane out of Portland.

An express service with rates of 10 cents a pound and 25 cents delivery charge for each package will be included. Passenger fares will be $20 one way and $35 round trip. More than 100 tickets, good during the first thirty days of operation, have been sold in Yakima.

INLAND Eaglerock Aircraft Company has been organized in Seattle, Wash. by C. A. Cault, William Holland, William Genero, Edgard C. Bigelow and H. N. Fogle. They will handle the distribution of Eaglerock planes in western Washington.

WALLA WALLA, Wash. has made extensive plans for an air circus to be staged there May 26th and 27th according to Cecil Graul, of the Graul-Langdon Flying School.

PORT Angeles Air Transport Company has been incorporated by Major Gilbert Haight Eckerson, H. B. Crisler and Max Church, for flying service work over the Olympic National Forest. Waco planes will be used.

AN air jubilee was held at Pasco, Wash. on April 15th in celebration of the completion of the first year of air mail service from Pasco.

Maneuvers of the national guard flying squadron and Mamer planes from Spokane raised enthusiasm to the highest pitch. Jimmie Lockwood's parachute jumping was also a great attraction. Model planes, made by the school children of Central Washington, were shown at the airport.

THE Washington Airport Association was organized at Pasco, Wash. with Thomas D. Stimson of Seattle as president and A. F. Wehe of Pasco as secretary.

An executive committee was appointed consisting of Leon D. Cuddeback, chief pilot of the Varney lines; J. R. Scott, manager of the Everett airport; A. F. Wehe, manager of the Pasco airport; L. L. Bruning, of Colfax, director of the state chamber of commerce.

The meeting was attended by Thomas D. Stimson, Seattle; Lieuts. Harold Neely, Jack Allenberg, Holter, Owen, Nick Mamer, Williams and Daniels of Spokane; O. A. Torgerson and J. R. Scott of Everett; County Commissioners J. E. Marble and E. B. Riley of Yakima County and J. C. Nunamaker and M. G. Radelmiller of Franklin County; Fred C. True, A. H. Eldridge, L. L. Bruning, Walter Talbot and J. R. Good of Colfax, Wash.; C. L. Strome, J. L. Cundiff, E. W. Tallman, A. C. Thomas, C. Pritchard Baxter, F. D. Hawley, A. H. Mann and John G. Langdon, jr., of Walla Walla; John A. Pederson of Pendleton, Ore.; L. G Sparks, Ellensburg; and Y. W. Peters, Hoquiam.

THE Federal radio commission has issued permits to the Boeing Air Transport Company to erect radio sending stations in 19 different cities for the purpose of keeping in communication with passenger planes operated by the company between Seattle and Los Angeles and San Francisco and Chicago.

Philip G. Johnson, president and general manager of the Boeing Company, announced that work would begin immediately on the construction of the stations and that all would be in operation within three months.

Thorp Hiscock has been put in charge of the communications department, with headquarters in Seattle.

Stations will be established in Seattle, Sacramento, Oakland, Redding, Concord, Fresno and Los Angeles, Calif.; Rock Springs and Cheyenne, Wyo.; Chicago, Ill.; Sioux City, Ia.; Omaha and North Platte, Nebr.; Salt Lake City, Utah; Elko and Reno, Nev.; Portland and Medford, Ore.

TRANSFER of all stock and equipment of the West Coast Air Transport Company, Portland, Ore., to the recently organized Union Air Lines for $500,000 is announced by Charles V. Eakin, president of both concerns. The incorporators of the new concern are Charles V. Eakin; L. G. Devaney, chief pilot; and Sadie Lee.

The equipment includes the two Bach passenger planes now in operation on the Pacific Coast route and two more under construction at Santa Monica, Calif. Included in the transaction is the contract of the West Coast Company with the Pickwick Stage System.

PLANS are being made by the Aero Club at Portland for an air carnival to be held June 17th to raise funds for the entertainment of the pilots of the 40 planes which will take part in the National Air Tour.

Swan Island will be opened early in June, and James H. Polhemus, general manager of the Port of Portland, soon will announce rules of administration.

CAPT. C. B. STEAD of the Seattle School of Aeronautics was elected president of the Seattle Air Club at a meeting held on the Sand Point field. Lieut. William Houseman was elected vice-president and Lieut. Harold Jensen, secretary-treasurer.

COAST Airlines, Inc., has been incorporated at Seattle, Wash., by R. D. Riegert, A. J. Bibler and T. T. Bernard, with a capital of $35,000. They will carry on a commercial air transportation company.



Brubaker photo.

Latest view of the Airport of Portland, Ore. Note the nearly completed causeway.

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FLOCO

Say you saw it in AERO DIGEST

WASHINGTON AIR NEWS

By C. M. Littlejohn

THE Olympic Aeronautical Corporation of Tacoma has been reorganized with the election of the following officers: president, L. E. Titus, of Olympia, Wash.; J. B. Story of Tacoma, vice president and manager; Cassius Gates of Seattle, secretary; and Lieut. R. F. Bradley of Tacoma, treasurer. Headquarters will remain at Tacoma, Wash. Plans are being made for expansion of the company.

PORT ANGELES, in its desire for an adequate airport and with no available space for a large airport, will fill in the bay to make the necessary space for a landing field about a third of a mile long and 350 feet in width.

A SECOND airport is planned for Bellingham. The Western Aero Construction Company of California has completed a lease of 25 acres of the Lind Gravel Company land just inside western city limits for this purpose.

AN ambitious air program is being started in Seattle by the Star Air Line Corporation. It is establishing air schools and taxi services, and has already applied for the first unit of a series of permanent hangars to be placed on the municipal airport at Georgetown. The company expects to start a regular schedule of freight and passenger air lines to Alaska and other sections and has been appointed distributor for the Thunderbird Aircraft.

OPERATING planes from the Bryn Mawr airport near Seattle, on Lake Washington, the Northwest Air Service has established ground and flying school courses embracing the history of aeronautics, theory and practice of flight, solo and stunt flying.

AERIAL mapping service, flying school, sight-seeing trips, and commercial flying are all embraced in the host of activities of the new organization to be known as the Continental Airways Company, established at Portland, Ore., W. E. French is president and treasurer of this corporation; Lieut. Gordon E. Mounce is general manager and vice president, and Fred W. Vincent is secretary. Aerial mapping of the Cascade mountains and a section south of Portland for a client has already been finished. Capt. F. O. Mercer is in charge of aerial mapping.

A. C. ST. JOHN and his son recently flew a new Ryan Brougham from California to Washington. It will be used in the St. John airport service at Chehalis. Vernon Bookwalter is chief pilot of the company.

SPACE at the new commercial airport of Seattle has been applied for by Aviation School, Inc., of which Harry B. Carney, of the Naval Reserve, is chief instructor. The school is also the Puget Sound distributor of Waco planes.



Lieut. Comdr. Joseph Lebrix; Mrs. Rose Tribe, Hawaiian singer; Arthur C. Goebel; Katherine Hummel, Hawaiian hula star; and Capt. Dieudonne Costes, at Honolulu.

HONOLULU AIR NEWS

By Vern Hinkley

AIR maneuvers of a scope not exceeded since the visit of the fleet here in 1925 are in prospect again this year with the arrival April 28 of more than 100 vessels of the United States Navy.

While no official plan for such tactics has been announced it is understood that the Army particularly will take the opportunity presented by the approach to the islands of a vast flotilla of war craft for use in scouting and simulated combat training.

The probability that the government will send the new aircraft carrier *Saratoga* to join the battle fleet here in June is hailed with pleasure by the air-minded population of the islands, and this embraces a large percentage of the population.

DURING April, it is expected, a regular air service between Honolulu, the capital city, and Hilo, the second metropolis of the islands, 200 miles south and west of the Island of Hawaii, will be opened. A private operator has purchased the *Aloha*, the Breese monoplane in which Martin Jensen took second place in the Dole Derby, and has obtained the services of Charles Stoffer, well known commercial aviator, as pilot.

The ship is now undergoing a complete overhaul and will be ready in April to take the air on a schedule which will carry it three times a week between the two cities.

The route will be over land and sea, crossing the islands of Molokai and Maui and skirting the long northerly coast of Hawaii. Flying time to Hilo, against the trade wind, will be virtually three hours, the return journey to be made in two hours. Landings at Hilo will be made on the recently completed municipal airport there, work on which was begun three years ago.

The Honolulu base will be at the Lewis airport, close to the business section, at least until the John Rodgers airport, territorial field, is in shape for the reception of craft.

THE Army Air Corps recently played a humanitarian rôle, carrying aid to a group of fishermen marooned by exceedingly heavy seas on a small island just off the north coast of Oahu.

Informed of the plight of the men, without food or shelter in the midst of a cold rainy spell, four pursuit pilots from Wheeler Field flying PW-9s, loaded their ships with blankets and food and circled over the island, a mile from shore, dropping their bundles. They had the satisfaction of seeing the fishermen scurry to pick up the packages.

Pilots participating in the "relief expedition" were Lieutenants Carlyle Ridenour, Charles A. McAllister, Walter Wheeler and Howard M. Fey.

ARTHUR C. GOEBEL, winner of the Dole Derby in August 1927, was welcomed to Honolulu again last week when he spent a day here en route to Japan on a friendship tour aboard the liner *Korea Maru*.

Greeted at the wharf and aboard ship by dozens of friends and acquaintances Goebel was half smothered in leis. Goebel was a speaker at the noonday luncheon of the Honolulu Ad Club.

With Goebel aboard the *Korea Maru* were Dieudonne Costes and Joseph LeBrix, French airmen who crossed the Atlantic from Africa to South America, who then flew to and across the United States and who continued their flight from the Orient to Paris, their starting point.

Among those to greet the three famous airmen was Capt. Lowell H. Smith, commander of the Army's 'round-the-world flight, now stationed at Wheeler Field, Schofield Barracks.

An Important Message

TO THE AIRCRAFT INDUSTRY

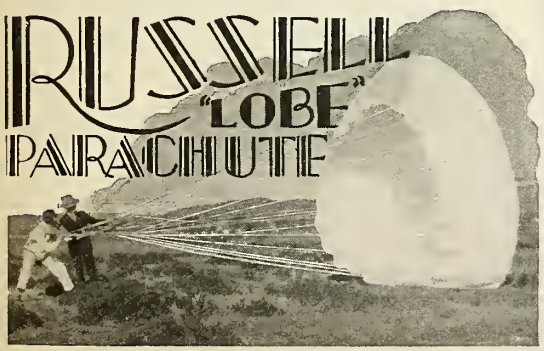
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UTAH AND IDAHO NEWS

By GLENN PERRINS

TWENTY-FIVE multi-motored airplanes carrying 206 passengers, in addition to guides and pilots, will stop at Woodward field, Salt Lake City, about the last of June, if plans of the American Airways Tours Company are completed. Salt Lake is to be one of the main stops on the western part of the huge aerial caravan itinerary.

CLARENCE M. YOUNG, assistant secretary of the Department of Commerce in charge of aviation, recently visited Salt Lake City and urged that Zion boost aviation. Following his visit, a survey of the field was ordered and many improvements of the field are being planned. Official air regulations now are enforced at the Salt Lake City airport.

GROUND is being broken for a new steel hangar, according to Felix Steinle, operations manager of the National Parks Airways, Inc. The new hangar will be built on a lot 120 by 150 and will be 95 feet frontage and 100 in depth, capable of housing the big Fokker Super-Universal planes the company will use.

A TRACT of land four miles due south of the post office and directly west of the Holther field is to be the new airport of Ogden, Utah. The city will lease the land for five years with an option to buy.

A COURSE in aviation will be given Jean D. Case and Crystal Keller, of Ogden for their prize essays in a contest recently conducted by the Ogden Aero Club. Other boys were awarded prizes of membership in the club.

GRADING and sanding of an additional 400 feet of the runway of the Boise, Idaho, airport will be accomplished soon. Mayor Walter Hansen favors a program for the lighting and enlargement of the Boise airport.

PURCHASE of 160 acres as a site for an airport at Pocatello, Idaho, has been made by the special committee appointed by the Pocatello Chamber of Commerce. The site is five miles from the city.

PLANS are underway at Twin Falls, Idaho, for the establishment of a commercial airport. The one selected comprises 34.3 acres, two and one-half miles north of Twin Falls, near the Snake river, and on the main highway.

WENDOVER, UTAH, is to have a landing field on the Salt Lake and San Francisco transcontinental airline. Two hundred acres of land will be used as an air field, located on the edge of the city.

THE establishment of a municipal airport on the Acquia townsite, near Rupert, Idaho, is being considered. The proposed landing field includes a tract of 400 by 4,300 feet, with more ground available.

AIR BEACONS LIGHTED

COLONEL LINDBERGH touched the button which lighted the Standard Oil Company's 10,000,000-candlepower Sperry beacons atop Mt. Diable, 25 miles southeast of San Francisco, and in the Merced Hills, Los Angeles County, just north of the Town of Montebello.

Herbert Hoover, Secretary of Commerce, and William P. MacCracken, jr., Assistant Secretary of Commerce for Aviation, gave radio speeches over a network of stations in recognition of the event.

The Standard Oil Company sought the services of engineers of the Sperry Gyroscope Company, Brooklyn, N. Y., to design the most powerful incandescent airway beacon possible, and as a result, the 36-inch size of revolving beacon using special 1500-watt 32-volt Westinghouse lamps was adopted.

Each beacon stands seven feet high, gives 10,000,000 candlepower and revolves 6 times per minute. They are visible to fliers at a distance of from 100 to 150 miles.

The beacons will be attended only by two robots—one the Sauter astronomical time switch which automatically turns the beacon on and off at dusk and dawn, and the Sperry automatic lamp changer which places a spare lamp into operation when the first lamp burns out.

They are supplemented by 50 foot "SD" and "SL" letters formed by continuous tubular red lights, the official designations of the Mt. Diablo and Merced Hills beacons.

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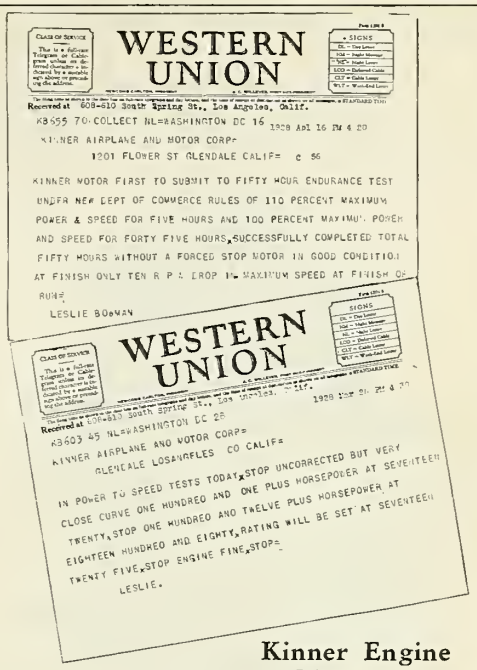
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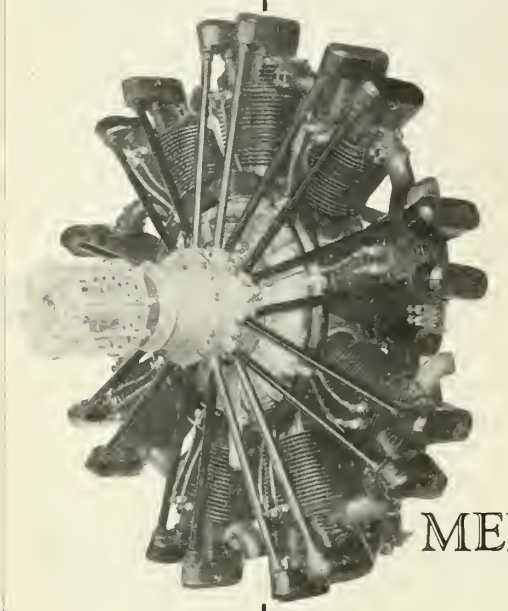
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AIR NEWS from ARIZONA

By "Wind Sock"

THE Ajo Chamber of Commerce and the local aviation committee invite all pilots flying in the National Air Tour and the National Air Derby to fly over Ajo where a good field is available and many miles can be saved by flying airline from Tucson to Yuma.

FLAGSTAFF will soon have an up-to-date municipal field. The field will be located east of town. Mrs. G. H. Roosevelt recently arrived here by plane, having completed the first flight over the Grand Canyon. She left the eastbound Santa Fé train at Seligman, boarded one of the Scenic Airway planes piloted by Douglas Kelly, and after several hours in the air over the Canyon the ship landed her in Flagstaff in ample time to continue her trip east on the same train she left at Seligman.

AIR taxi service throughout the states of Arizona, Southern Utah and Sonora, Mexico, has been inaugurated by J. Parker Van Zandt of the Scenic Airways, Inc. The intentions of the company are to link up points of interest throughout the state. Six passenger Stinson-Detroiters will be used in this service.

THE Aero Corporation of Arizona has adopted a new way of getting Arizonians "air broke". They make short hops over Tucson on Mondays, Wednesdays and Fridays after passengers from Los Angeles and Phoenix have landed.

P. A. SHILLING, a local rancher, and George D. Hoffman took delivery of a Waco-10 which Hoffman piloted for Mr. Shilling. Hoffman is a graduate of the Mayse School of Flying at Tucson. They later sold their Waco-10 to Mrs. Lindley, a student of the Mayse school, and purchased a Lincoln-Page. Walter Ballard and Hoffman flew the ship from Lincoln, Nebraska to Tucson in 10 hours and 45 minutes. Stops were made at Liberal, Kansas and Roswell and Deming, New Mexico.

SERGEANT JOHN S. PHILLIPS, who is in charge of the U. S. Signal Meteorological station at Tucson is giving out daily meteorological messages from the Tucson station to pilots flying over the Southern Arizona airway.

ALEXANDER FACTORY FIRE WILL NOT DELAY PRODUCTION

A FIRE which razed the doping and wing covering building at the Alexander factories at Denver, Colo., destroyed fifteen sets of Eaglerock wings. The equipment is being replaced at once and the output of complete ships will be delayed only about three days.

ARIZONA AIR NEWS

By Al Wein

PLANS for securing a tract of 300 acres to be used as a landing field for the City of Safford are being made by the Graham County Chamber of Commerce. The proposed field, about one mile south of Safford on the Bowie highway, is ideal for a permanent airport for the city.

THE new Prescott airport, located about eight miles from the city, has been equipped with telephone service, a much needed facility. The field is now in excellent condition, both runways being well graded and marked out.

MORE than three thousand persons visited the Chandler airport the latter part of March to see an aerial circus presented by Pilots Howard Rinehart and Verne Whelan, of the Rinehart-Whelan Airport.

A NEW big sign, directing aviators to the Phoenix airports, has been placed on top of the newly-completed Southern Pacific car sheds adjoining the Union Station.

ESTABLISHING a new record for a flight from San Diego to Tucson, Lieut. Charles Douglas, piloting a Douglas Army plane, made the distance in two hours and 50 minutes, clipping 20 minutes from the former mark. The army flier was aided by a strong tail-wind.

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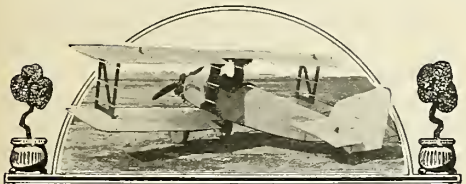
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THE AERONAUTICAL INDUSTRY

NATIONAL AIR TOUR

JAMES GORDON BENNETT INTERNATIONAL BALLOON RACE AND THE NATIONAL MODEL AIRPLANE CONTEST

HAVING brought to a successful close the All-American Aircraft Show, the aircraft events committee of the Detroit Board of Commerce is preparing for three other major events of its 1928 program. These are: The National Air Tour; The James Gordon Bennett International Balloon Race; The National Model Airplane Contest.

All of them are scheduled for June 30, at the Ford Airport in Dearborn, and they will be managed by Ray Cooper, who guided the destinies of the recent show and of last year's tour.

The 1928 tour, according to present plans, should be the most extensive reliability contest as yet engaged in by American manufacturers of aircraft. It will cover a course approximately 6,000 miles in length, will touch 24 cities and will be in progress 28 days. The first national air tour covered 1,900 miles and lasted one week; the second covered 2,600 miles in two weeks, and last year's event flew a 4,000-mile course in 15 days.

While the itinerary is not definitely decided upon, Manager Cooper has prepared this tentative list of stopping points: Indianapolis, St. Louis, Tulsa, Fort Worth, San Antonio, Houston, El Paso, Tucson, Phoenix, San Diego, Los Angeles, Fresno, San Francisco, Oakland, Medford, Portland, Spokane, Missoula, Great Falls, Minot, St. Paul, Wausau, Chicago, Battle Creek and then to the starting point, Ford Airport. Some of the cities named may be dropped and others added before the entry lists are closed at midnight, June 16.

Entries may be made by manufacturers only. A manufacturer may, however, designate a purchaser of one of his ships as an entrant. The rules of the tour, as roughly outlined to manufacturers in attendance at the All-American Show, met with hearty approval, and the number who announced they would have ships in this year's event indicated a record list of contestants.

Prizes, in addition to the beautiful Edsel B. Ford trophy for the winner, will amount to $12,000 in cash, divided as follows: first, $2500; second, $2000; third, $1750; fourth, $1500; fifth, $1250; sixth, $1000; seventh, $750; eighth, $550; ninth, $400; and tenth, $300. The trophy and first cash prize were won last year by Eddie Stinson, in a Stinson-Detroiter.

While the air tour is a purely national event, an international aspect is lent to the starting day by the simultaneous beginning of the balloon race. Manager Cooper anticipates 16 entrants, most of them from foreign countries. Among the countries to be represented for the first time are Denmark and Argentina.

The model airplane contest will bring together boy plane builders from all parts of the country. It has been greatly stimulated this year by the nationwide participation fostered by the *American Boy* magazine.

AIR MAIL BIDS

SEALED proposals will be received at the Post Office Department in the city of Washington until 12 o'clock noon, May 21, 1928, for carrying the United States mails on the following routes:

From Key West, Florida, to Havana, Cuba, a distance of 103.4 *miles, on a daily schedule (for a period of five years commencing July* 1, 1928).

From Landing Point (n.o) at Seattle, Washington, to Victoria, British Columbia, about 84 *miles, and back, in close connection at Victoria with outgoing and incoming trans-Pacific mail steamers (from July* 1, 1928(*or such subsequent date as the Department may order, to June* 30, 1929).

From Landing Point (n.o.) in New Orleans, Louisiana, to Pilottown, about 80 *miles, and back, or to Port Eads, La., about* 92 *miles and back, when practicable, in close connection at Pilottown or Port Eads with outgoing and incoming Central American and Havana, Cuba, steamers (from July* 1 1928, *or such subsequent date as the Department may order, to June* 30, 1929.)

NEW AIRLINE ROUTES and SCHEDULES

THE following new airline schedules and changes in schedules have been established since the April issue. A complete list of mail, passenger and express airlines was printed in the December issue. New lines opened since that date or new schedules have been added in each succeeding issue.

Air Mail

C. A. M. 19—NEW YORK, N. Y.; PHILADELPHIA, PA.; WASHINGTON, D. C.; RICHMOND, VA.; WINSTON-SALEM, GREENSBORO, HIGH POINT, N. C.; SPARTANBURG, S. C.; ATLANTA, GA. Operated by Pitcairn Aviation, Inc. (Opened May 1.)

Time Table (Eastern Time)

Southbound (Read down)			*Northbound (Read up)*
9:40 p.m.	Lv.	New York, N. Y.	Ar. 4:35 a.m.
10:24 p.m.		Philadelphia, Pa.	3:56 a.m.
11:45 p.m.		Washington, D. C.	2:35 a.m.
Southbound (Read down)			*Northbound (Read up)*
1:02 a.m.		Richmond, Va. (Winston-Salem, N. C.) (Greensboro, N. C.)	1:28 a.m.
2:59 a.m.		(High Point, N. C.)	11:21 p.m.
4:32 a.m.		Spartanburg, S. C.	9:50 p.m.
6:17 a.m.	Ar.	Atlanta, Ga. Lv.	8:00 p.m.

C. A. M. 23—ATLANTA, GA.; BIRMINGHAM, MOBILE, ALA.; NEW ORLEANS, LA. Operated by St. Tammany Gulf Coast Airways. (Opened May 1.)

Time Table (Central Time)

Southbound (Read down)			*Northbound (Reod up)*
5:30 a.m.	Lv.	Atlanta, Ga. Ar.	6:30 p.m.
7:10 a.m.		Birmingham, Ala.	4:55 p.m.
9:30 a.m.		Mobile, Ala.	2:35 p.m.
11:00 a.m.	Ar.	New Orleans, La. Lv.	1:00 p.m.

Passenger Line

SAN DIEGO, SANTA ANA, LONG BEACH, LOS ANGELES, BAKERSFIELD, FRESNO, SAN JOSE, CALIF. Operated by Maddux Air Lines.

Time Table

Northbound (Read down)			*Southbound (Read up)*
8:00 a.m.	Lv.	San Diego	Ar. 5:45 p.m.
8:50 a.m.		*Santa Ana	5:00 p.m.
9:00 a.m.		*Long Beach	4:50 p.m.
9:30 a.m.	Lv.	Los Angeles	Ar. 4:30 p.m.
11:00 a.m.		*Bakersfield	12:30 p.m.
12:10 p.m.		Fresno	11:20 a.m.
1:30 p.m.		*San Jose	9:50 a.m.
1:45 p.m.	Ar.	San Francisco & Oakland	Lv. 9:30 a.m.

**Stops on reservation only.*

Passenger Rates

Between and	*Kind of ticket*	*San Diego*	**Santa Ana*	**Long Beach*	*Los Angeles*	**Bakersfield*	*Fresno*	**San Jose*	*San Francisco and Oakland*
San Diego	O.W.		$15.00	$15.00	$15.00	$30.00	$42.00	$55.00	$60.00
	R.T.		27.50	27.50	27.50	55.00	80.00	105.00	110.00
*Santa Ana	O.W.	15.00			8.00	23.00	35.00	48.00	53.00
	R.T.	27.50			15.00	42.50	66.00	92.00	100.00
*Long Beach	O.W.	15.00			8.00	23.00	35.00	48.00	53.00
	R.T.	27.50			15.00	42.50	66.00	92.00	100.00
Los Angeles	O.W.	15.00	8.00	8.00		15.00	30.00	40.00	45.00
	R.T.	27.50	15.00	15.00		27.50	55.00	77.00	85.00
*Bakersfield	O.W.	30.00	23.00	23.00	15.00		15.00	30.00	32.00
	R.T.	55.00	42.50	42.50	27.50		27.50	57.50	60.00
Fresno	O.W.	42.00	35.00	35.00	30.00	15.00		20.00	25.00
	R.T.	80.00	66.00	66.00	55.00	27.50		37.00	46.00
*San Jose	O.W.	55.00	48.00	48.00	40.00	30.00	20.00		8.00
	R.T.	105.00	92.00	92.00	77.00	57.50	37.00		15.00
San Francisco and Oakland	O.W.	60.00	53.00	53.00	45.00	32.00	25.00	8.00	
	R.T.	110.00	100.00	100.00	85.00	60.00	46.00	15.00	

(* *Stops on reservation only.*)

Reservations and Information

San Diego—Leading hotels; Maddux Airport, 3330 Burnett Ave.; *Santa Ana*—Martin Airport; *Long Beoch*—Leading hotels; *Los Angeles*—Maddux Air Lines, Inc., 2100 S. Figueroa; *Bakersfield*—Leading hotels; *Fresno*—Leading hotels: *San Jose*—Leading hotels; *San Francisco and Oaklond*—Maddux Air Lines, Inc., 672 Market Street; Crabtree Travel office, 412 13th St., *Oakland; Berkeley*—Crabtree Travel office, 2148 Center St.

TRUSCON HANGARS



A TRUSCON HANGAR IN USE BY
THE FAIRCHILD AIRPLANE MFG. CORP.
FARMINGDALE, LONG ISLAND.

AIRPLANE Hangars must be laid out in clear spans so that the entire floor space is unobstructed, allowing maximum freedom in handling ships. Doors of unusual width must be provided in one or both ends of the building to permit easy entrance and egress of the planes. The entire building should be non-combustile because of the unusual fire risk. Furthermore, the impossibility of foreseeing future needs, makes it advisable to select buildings with a high salvage value; buildings that may be taken down and reerected at a new site or enlarged to take care of additional needs.

Truscon Standardized Steel Hangars, furnished from stock, are designed to meet all of these conditions.

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TRUSCON STEEL COMPANY, YOUNGSTOWN, OHIO

MANUFACTURERS AND ENGINEERS





COMPLETE BUILDINGS FOR ALL AIRPORT REQUIREMENTS

PENNSYLVANIA NEWS

By Ray Krimm

THE New York-Philadelphia-Washington-Atlanta-New Orleans airline, 1,242 miles long, started on May 1. It runs from New York via Philadelphia, Washington, Richmond, Greensboro, N. C., Spartanburg, S. C., Atlanta, Ga., Birmingham and Mobile, Ala., to New Orleans.

Government officials at Washington and municipal authorities and civic organizations at cities along the route joined in ceremonies on the opening night to celebrate the inauguration of service on the newest of the trunk air mail routes of the country.

Pitcairn Aviation, Inc., of Philadelphia, is operating the New York to Atlanta route, and the St. Tammany Gulf Coast Airways is operating the connecting line from Atlanta to New Orleans. Bids have already been asked for an extension of this route from New Orleans to Laredo, Texas, to meet the proposed Mexican air mail from Mexico City, and a contract has been given to Pitcairn Aviation, Inc., to operate an extension of the line from Atlanta to Miami, where Pan American Airways planes to Havana will connect with the air mail. At New York, the Atlanta to New York line connects with the transcontinental air mail line and the Boston air mail line.

LUDINGTON Philadelphia Flying Service has received another Fairchild cabin monoplane, its second within a few months.

The company has recently completed a 40 by 72-foot woodworking shop and a 100 by 40-foot metal shop bringing the Ludington investment at the Philadelphia Airport to $140,000.

Charles Townsend Ludington, president of the Ludington Philadelphia Flying Service, has a new Waco-10 with a Siemens-Halske engine for his personal use.

WILLIAM H. VEALE of Hazleton, Pa., reports several additional sales of three-place Challengers during the month. George Zinn, a former Pitcairn student and employee, has branched out for himself, purchasing two Challengers from the Veale company to inaugurate his new Rainbow Aviation Co. at Philadelphia.

CLARENCE CHAMBERLIN, New York to Germany flier, spoke at Erie, Pa., on April 10 under auspices of the Aero Club of Erie and was given a hearty welcome and reception. The Aero Club staged a dinner in honor of the visitor and considerable impetus was given the club's movement to awaken Erie to the advisability of establishing an airport.

GEORGE R. HUTCHINSON, of Abington, has applied for a license for the operation of airplanes as common carriers in Eastern Pennsylvania. He has remodeled the former government flying field at Red Lion Road and Roosevelt Boulevard, Philadelphia, and has devoted 100 of its 155 acres to a modern airport.

MEETING at Harrisburg, the State Armory Board, headed by Gen. William G. Price, chairman, voted an appropriation of $20,000 for initial construction work on a new administration building and shop to be built for the 28th Division Air Corps, Pennsylvania National Guard, at the Philadelphia Airport. The new buildings are expected to cost over $100,000.

PHILADELPHIA was well represented at the All-American Aircraft Show in Detroit last month. Pitcairn Aviation, Inc. had one of the company's new Sport Mailwings (Wright Whirlwind) on display for the first time and the B. B. T. Corporation of America had four of its airport lights on exhibit.

Among those who attended the show from the Philadelphia district were: Harold F. Pitcairn, president of Pitcairn Aviation, Inc.; James G. Ray, manager of operations; Geoffrey S. Childs, general manager and vice president; W. Lawrence LePage, assistant to the vice president; Charles Townsend Ludington, president of the Ludington Philadelphia Flying Service and the B. B. T. Corporation of America; W. R. Huntsman, general manager of B. B. T.; W. G. Trieber, an illuminating specialist from the same organization; Reuben A. Fowler, secretary-treasurer of the Crescent Air Service, Inc.; J. Wesley Smith, president of the Philadelphia Air Transport Company and treasurer of the Aero Service Corporation; Major J. Sydney Owens and Sergeant J. R. Kelly, of the 28th Division Air Service, P. N. G.

Robert P. Hewitt, manager of field operations for the Ludington company at the Philadelphia Airport, had intended flying the company's Fairchild cabin monoplane to the show but elected instead to fly to Murray's Bay on the *Bremen* assignment for the Acme Photo Service of New York. He was accompanied by John Busher, veteran pilot-mechanician of the Ludington staff.

A COMPREHENSIVE, sixteen page catalogue, replete with forty-one illustrations and describing their complete line of airport lighting equipment, has been issued by the B.B.T. Corporation of America.

The catalogue stresses how important it is that every landing field be equipped with adequate aviation facilities, including complete night landing equipment.

SO. NEW JERSEY NEWS

By Ray Krimm

ORGANIZING for the purpose of furnishing flying instruction to club members at net cost, the Burlington County Aero Club, with headquarters at Moorestown, N. J., has taken over the operation of a 75-acre flying field one mile outside of Moorestown. The flying field is approachable from all directions and the ground is graveled.

Extensive improvements will be made and construction work has been started on a 50 by 80-foot hangar. Gasoline and oil tanks have been installed at the field and service is available to visiting pilots.

The club has purchased a new Waco-10 from John E. Thropp, 3d., a dealer who acts as agent for the Ludington Philadelphia Flying Service.

THE Burlington County Aero Club, founded last February 15th, has sixty members. Meetings are held on the first and third Monday nights of each month, in the Community House at Moorestown.

H. H. Longanecker is president, William DeR. French is treasurer, and H. B. Smith is secretary of the organization.

HARRY H. KRECHMER has resigned as president of the Aero Club of Atlantic City and John Brunton, prominent club and business man of the resort, was unanimously elected president to succeed Krechmer. William G. Williams was elected vice president.

Twenty-six new members were admitted to membership at two recent meetings.

"AL" GRAHAM, than whom there is no than-whomer in the barnstorming business, has been made chief pilot at the Crescent Airport, Camden, which is operated by the Crescent Air Service, Inc.

Graham went to the Crescent Airport from York, Pa., where he was employed by the York Airways. He succeeds George C. Hand, who resigned this month to accept a position with Veale Aviation, Inc., at Hazleton, Pa.

EVERY aviation organization in the Philadelphia-South Jersey district was represented at the dedication on April 14, of the Crescent Airport. Hundreds braved a chilly rain to visit the field during the morning and hundreds more attended the ceremonies during the afternoon.

Reuben A. Fowler, secretary-treasurer of the Crescent Air Service, Inc., represented the Aero Club of Atlantic City; Dr. Thomas E. Eldridge, of Philadelphia, represented the Aero Club of Pennsylvania, A. N. Chambers, second vice-president, and Lieutenant Victor Williams, chief pilot, represented the South Jersey Aviation Club; D. G. Hendrickson, president, represented the Aero Club of Philadelphia; the Burlington County Aero Cluh was represented by several members and there were similar representations from other aviation organizations in the district.

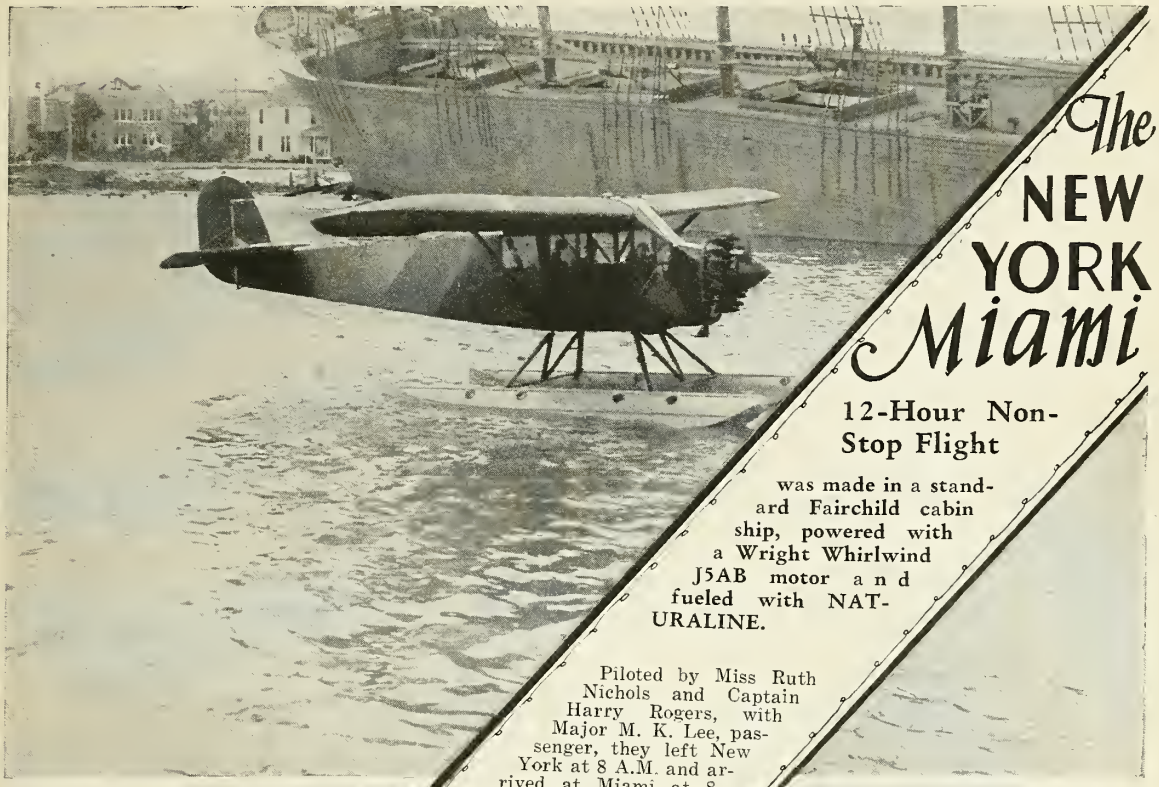
Trenton, N. J., was represented by city and aviation officials.

E. Browne Pardee, president of the Collingswood Chamber of Commerce, one of the speakers, welcomed the company to South Jersey on behalf of the Pensauken Township Committee, members of that committee added their greetings, welcomed the guests and were hosts to hundreds of visitors at a luncheon served in the new restaurant building that has just been completed at the Crescent Airport.

Pitman Airport

PITMAN now has an airport which was leased by Russ Myres.

The boys of Pitman have organized a club called the "Lone Eagle Model Club." They meet every month and discuss the general topics of aviation and build scale models. Fred Heppard is president; Harry John, vice president; and Earl Rhodes secretary and treasurer.



The NEW YORK Miami

12-Hour Non-Stop Flight

was made in a standard Fairchild cabin ship, powered with a Wright Whirlwind J5AB motor and fueled with NATURALINE.

Piloted by Miss Ruth Nichols and Captain Harry Rogers, with Major M. K. Lee, passenger, they left New York at 8 A.M. and arrived at Miami at 8 P.M. without a halt.

Captain Harry Rogers writes: "One of the outstanding features of the trip was the smoothness of the motor. Not only did the gas give us more power for take-off, but it was very economical from a consumption basis. We can readily notice the difference now in using other gas."

"Both Miss Nichols and myself want to congratulate you on your product. Thanking you for past courtesies, I beg to remain

Very truly yours,

HARRY ROGERS,
President, Rogers' Air Lines, Inc."



CHESTNUT & SMITH
CORPORATION
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A SUPER AVIATION MOTOR FUEL

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The decided advantage of NATURALINE is that it is 47 pounds per hundred gallons lighter than U. S. Fighting grade gasoline and gaslock has been eliminated.

GEORGIA AIR NEWS

By Al Major

WILLIAM P. MACCRACKEN, JR., Assistant Secretary of Commerce in charge of Aeronautics, and W. Irvin Glover, Second Assistant Postmaster General, Governor L. G. Hardman, Mayor I. N. Ragsdale and high officials of companies holding air mail contracts were present for the opening ceremonies of the New York-Atlanta and the Atlanta-New Orleans air mail.

OFFICIALS of the St. Tammany and Gulf Coast Airways, holders of the New Orleans contract, recently visited Atlanta to complete local arrangements and they advise that, in addition to the mail service, a passenger schedule will be maintained regularly between Atlanta and Birmingham with a fare of $15 between the two cities. Pending the lighting of the New Orleans route, the mail plane will leave that city around noon arriving in Atlanta before dark, in time to provide a connection with the New York mail planes. On the trip to New Orleans the southbound plane will leave Atlanta around 7:00 o'clock after receiving mail from the New York plane.

BRUNSWICK'S new airport, Redfern Field, located on St. Simon's Island, will soon be ready for use. Redfern Field, however, will not be the city's permanent airport, as another much larger and better equipped is to be constructed by the county.

JOHN K. OTTLEY, jr., prominent in social, civic and journalistic circles of Atlanta, has been designated as the local representative of the Pitcairn organization. We are all very glad to see Mr. Ottley get this appointment, as he has been very active in promoting aviation in this section.

HAROLD E. GOODENOW, chairman of board of directors, Western Division of United States Air Force Association, has announced the appointment of W. O. Browne as executive director for the association in Georgia, Alabama and Florida. The national headquarters of the Association are at Washington, D. C. Col. J. Edward Cassidy, Director General, while General William Mitchell, is Chairman of the Executive Committee and Capt. Eddie Rickenbacker is National Chairman.

TIFTON, GA., will have an ideal airport. The site recently was selected by the airport committee of the board of trade.

BEN KING, operator of the Chattanooga airport, and Georgia F. Milton, editor of the *Chattanooga News*, recently conferred with Candler Field officials on the feasibility of establishing passenger service between Atlanta and Chattanooga, Tenn.

ANNOUNCEMENT that commercial air service will be in operation between Atlanta and St. Petersburg, Fla., by next fall was made by P. S. Cowell, one of the St. Petersburg business men interested in the organization of the Dixie Airways, Inc. The company has completed its preliminary surveys and a plane is expected to make a trial flight between the two cities shortly. Among those interested in the company are: Frank Booth, head of the Tropical Airways, Inc., Clearwater, Fla., which opened Havana Service recently; Byrd M. Latham, manager of the Gandy Bridge Company, R. W. Johnston, Ft. Myers, Fla., and Mr. Cowell.

SAVANNAH probably will be made a port of call for a proposed airline between New York and Havana. Warren B. Ferris, representing the Seaboard Airways, Inc., recently was in Savannah looking over their landing facilities.

VALDOSTA, GA., will establish a standard Government approved municipal airport shortly. It will probably be named Tillman Field in honor of H. Y. Tillman, executive vice president of the Citizens & Southern Bank, who has donated the 100 acres of land for the airport.



Chesapeake Aircraft photo.

Proposed Baltimore Airport site, 1000 acres, a part of which will have to be filled in. The small area marked at right of the port is Logan Field.

BALTIMORE AIR NEWS

By Edward Johns

DR. FRANCIS D. COMAN, assistant resident surgeon of Johns Hopkins Hospital at Baltimore, has been chosen by Comdr. Richard E. Byrd as medical member of the expedition to the South Pole. Now Doctor Coman is busy with plans and tests in preparation to what he calls "the greatest opportunity for service that fortune has given any man."

A MODEL airplane tournament was held April 14 in the Richmond Market Armory. About 125 model planes were flown and a crowd of nearly 1,000 persons watched the exhibition, which was conducted by the Playground Athletic League and *The Evening Sun*.

Col. John A. Hambleton, who attended, announced that he will provide a cup for competitive flights of models at all future meets, to be known as the John A. Hambleton Trophy. Each winner will have his name engraved on it and three successive winnings will give permanent ownership.

Outstanding model fliers in the meet were Samuel Rabl, who won gold medals for each event he entered, and Ralph Levitz, who took four gold and one silver medal. Paul Edward Garber, of the Smithsonian Institute, Washington, was chief judge.

SUMMER activities have been resumed by the Air Corps, Maryland National Guard. The unit has received its third Curtiss Falcon (O-11), and are working out problems in tactical operations.

Capt. Edward C. Black, air officer of the Third Corps Area, flew all the Falcons to Baltimore. He smashed a local record by traveling the 360 miles between Buffalo and Baltimore in one of them in exactly two hours. The planes average about 125 miles at three-quarters throttle, and a tail wind boosted that to 180 miles an hour at 6,000 feet.

AN aeronautical class has been formed by the Jewish Educational Alliance. Morris Kravitz, who has built two planes of his own design, is teaching the theory of flight and the principles of construction.

COL. JOHN A. HAMBLETON has been named a director in the United States Aeronautical University.

LEE H. DICE and Ray Ott have returned from a winter barnstorming tour of the Carolinas and have opened the Conowingo Flying Service, carrying passengers over the beautiful Conowingo lake. The lake is the result of the second largest dam in the United States, exceeded only by Muscle Shoals. They have a Waco-10 and are doing plenty of business.

DAVID R. McCAULEY has left the hospital, where a broken leg put him, and has sprouted wings again. He is covering the Eastern Shore of Maryland at present, carrying passengers on cross-country and joy rides. (*Continued on next page*)



LEARN TO FLY
... at a PITCAIRN SCHOOL

The Pitcairn method of training pilots is unique. It is based upon Pitcairn experience as manufacturers of airplanes, as air mail contractors and as extensive commercial operators of airplanes, resulting in an intimate knowledge of just what a pilot should be taught to qualify for private flying and general commercial work.

The Pitcairn method of instruction has been so successful that there are now five schools operating in five eastern states. Each school is located on a commercial airport, giving students the advantage of intimate contact with commercial flying operations.

Courses of ten hours, twenty hours and fifty hours are offered, each course being supplementary to the next shorter, allowing a change to longer courses without interruption of study. The courses closely parallel those of military service schools and are conducted all-year-'round. Reasonable board and lodging may be obtained near each field.

Anyone interested in learning to fly should investigate the Pitcairn Schools before making a choice. A booklet giving detailed information on Pitcairn methods of instruction with a synopsis of courses offered, and setting forth the many advantages of the Pitcairn Flying Schools, will be mailed at your request. Write for it today.

Pitcairn Flying Schools are located as follows:—

IN PENNSYLVANIA

Pitcairn Aviation of Pennsylvania, Inc. operators of Pitcairn Field at Willow Grove, just north of Philadelphia. The largest commercial flying field east of the Mississippi. Training at Pitcairn Field offers the special advantages of close proximity to the Pitcairn aircraft factory at Bryn Athyn, Pa., where all phases of construction may be observed.

IN VIRGINIA

Pitcairn Aviation of Virginia, Inc., operators of Richard E. Byrd Field at Fort Lee, Va., the municipal airport of Richmond. Byrd Field is a regular stop on the New York-Atlanta air mail line. Located seven miles east of Richmond close by Fort Lee station of C. & O. Railroad.

In NORTH CAROLINA

Pitcairn Aviation of North Carolina, Inc., operators of the Greensboro Municipal Airport, at Friendship, ten miles west of Greensboro. A regular stop on the New York-Atlanta air mail line and a center of constant flying activity.

IN SOUTH CAROLINA

Pitcairn Aviation of South Carolina, Inc., operators of the Spartanburg Municipal Airport, three miles southwest of the city. A regular stop on the New York-Atlanta air mail line.

IN GEORGIA

Pitcairn Aviation of Georgia, Inc., operates at Candler Field, the Atlanta Municipal Airport. Located at Hapeville, eight miles south of Atlanta. The terminal of the New York-Atlanta air mail line and the Atlanta-New Orleans air mail line.

PITCAIRN AVIATION INC.

LAND TITLE BUILDING, PHILADELPHIA

(Baltimore News continued)

The Chesapeake Aircraft Company Opens Passenger-Carrying Station

ON Sunday, April 15th, The Chesapeake Aircraft Company, of Baltimore, Maryland, held the official opening of its new passenger carrying station and headquarters, at Logan Field, the present Baltimore airport. The day was cold and overcast, yet 3,500 people visited the flying field to witness the activity in the air.

This company has built a model layout at Logan Field. The passenger station has a large lounge room for passengers awaiting flights, and a special lounge room and equipment room for students who take instruction. A ticket office, rest room for ladies, a field manager's office and store room are included in the spacious building. Running water and a first aid station are added comforts. The roof is used for the timer, who has a clear vision of the large level flying field. Loud speakers have been installed. Two pavillions, a lunch room and other conveniences have been installed.

The Chesapeake Aircraft Company is now operating eight planes, one Fairchild cabin monoplane, which was recently christened *The Blue Heron* and is the flagship of the fleet, five Travel Air planes, one special student instruction plane and one special photographic monoplane. The company is a distributor for the Fairchild in Maryland, and for the Travel Air in Maryland, Delaware, Virginia and the District of Columbia. Two large hangars with modern shop facilities have been built to store the company's and privately-owned or visiting planes.

This company has specialized in aerial photography and has a large photographic laboratory equipped for handling mosaic mapping and oblique photography. A city office in the Richmond Market Armory in Baltimore is open every day and a corps of expert personnel is always on hand. At Logan Field, mechanics and pilots and service for visiting planes are on hand day and night.

Logan Field is the only commercial field in Maryland holding an A-1 Government rating for flying facilities and safe flying conditions. For this reason, the Chesapeake Aircraft Company, which has been operating for two years along specialized lines, selected it as its passenger and student instruction headquarters.

Col. John A. Hambleton, a local banker and former commanding officer overseas of the 27th Aero Squadron, is president of the company, and Major William D. Tipton, commanding the Maryland National Guard Air Unit, which was the first unit of its kind to be formed in America, is vice president and general manager. Major Tipton was an ace overseas, was shot down and captured and has led an active aeronautical life in and near Baltimore. All pilots and mechanics are members of the local National Guard Unit, which has been functioning for eight years. All pilots hold transport licenses and the mechanics, government licenses. Student instructors have all flown over fifteen different types of aircraft and have had ten years of flying experience.



Personnel of the Chesapeake Aircraft Co. of Baltimore, Maryland (Logan Field): *Standing in center, Maj. Wm. D. Tipton, vice president and general manager; at Tipton's right, Col. John A. Hambleton, president; at Tipton's left, Lieut. Robert Stewart, field manager; at Col. Hambleton's right, T. T. Perry, sales manager. Others are pilots, mechanics and personnel.*

TEXAS AIR NEWS

By Mont Hurst

THE City of Dallas has finally purchased Love Field outright from the Love Field Corporation and citizens and fliers in this section are jubilant over the buy. The purchase price of the field is $325,000, which will be paid for by the sale of bonds under the Ulrickson Plan.

PHIL LAMPERT, field manager at Dallas for the National Air Transport, Inc., has been made acting manager of Love Field now that the city has purchased it. A permanent manager for the municipal field will be decided upon at some later date.

AIR traffic regulations for Love Field provide that all pilots operating on or from airport shall be licensed by the Department of Commerce and shall obtain a permit from the City of Dallas; that planes taking off to north or east shall not make any left turns, and planes taking off to south and west shall make no right turns in the immediate vicinity of the flying field.

State legislation regulating flying was considered at a meeting in Dallas in April. The Junior Chamber of Commerce aviation department, the Dallas Aviation Club and the Chambers of Commerce in 500 Texas towns attended the conference.

THE city of Laredo, Texas, on the Mexican border, has purchased land for a municipal airport. The site is five miles north of Laredo and comprises 408 acres. The city paid $25,000 for the land and it will be improved with drainage, a runway of 6,000 feet, and hangars.

A UNIT of the Aviation Cadets of America has been organized in Waco. More than fifty comprise the initial membership. Officers of the Waco Cadets are: Cadet Major, James Broderick; Captain, O. C. Harrison; Adjutant, Murray Neal; First Lieutenants, Charles Sadler and Edward Howell; Second Lieutenants, Beaumont Cornett and Norman Smith.

THREE new air mail lines were started in the Republic of Mexico on April 15th. They have the east coast run and will eventually make direct connection with the proposed International Air Mail Services. The new lines, which are owned and operated by the Mexican Government, run between: Tampico-Mexico City; Vera Cruz-Mexico City; and Tuxpan-Mexico City.

NATIONAL AIR TRANSPORT FLYING SERVICE, INC., will begin operations in Dallas soon. The new service is a branch of National Air Transport, Inc., and it is planned to conduct passenger carrying and pleasure trips along with charter service. A Ford tri-motored monoplane and a four-passenger Travel Air monoplane will be used. Herbert Kindred, pilot of the National Air Transport, will be in charge at Dallas. Rates of 50 cents a mile will be charged on the new service.

WAYNE G. NEVILLE, pilot on the N. A. T. Dallas-Chicago air mail line of Transport, recently made a new speed record between Ft. Worth and Kansas City. Flying at night, he made the trip from Ft. Worth to Kansas City in four hours including stops, averaging 140 m.p.h.

AN air circus will be staged at Meacham Field in Ft. Worth during the annual convention of the West Texas Chamber of Commerce on June 18, 19, and 20. Three thousand dollars in prizes will be offered to competing fliers and the Chamber of Commerce will stage an entertainment for them. The Aviation Club of Ft. Worth will have charge of the air circus.

MAY 1st to 15th has been designated by the Dallas Chamber of Commerce as "Put Wings On Your Mail" campaign weeks and an intensive drive will be launched. Other cities on the air mail lines in Texas will cooperate in the campaign.

THE new air mail line from Minneapolis and St. Paul will make a direct connection with the Dallas-Chicago line of the National Air Transport thus giving Dallas and the Southwest a direct connection with those two cities.

AN American altitude record for women fliers is claimed by Janice Longley of Dallas. With Capt. Bill Long, president of Southern Airways, Inc., in a 150 h.p. Swallow plane, they attained an altitude of 17,000 feet.

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WHETHER you are interested in becoming an Aeronautical Engineer, Airplane Constructor, Welder, Rigger, Expert Engine Mechanic, Tester, Navigator or Pilot, we are here and ready to prepare and qualify you for a position in any branch of the aviation industry.

8
SOUND REASONS

Why You Should Enroll With the Aviation Engineering School











1 Because we prepare and qualify you for all Government Licenses.

2 Because you "LEARN BY DOING". No books, lecture courses or other methods of instruction are equal to our PRACTICAL TRAINING.

3 Because no other school in the north has as much or near as much modern equipment as our school.

4 Because we employ nothing but up-to-date machinery in building the new All Steel Government Approved Planes—both open and closed types.

5 Because our school is no "fly-by-night" proposition, but a school built upon reputation, a school headed by honest people and one which is recommended by leaders in the Aeronautical Industry, by all leading magazines, and in fact, by every person who has visited our institution or who knows anything about it.

6 Because OUR courses are made so plain, so practical that even the simplest minded are capable of grasping them.

7 Because no false representations are made to induce prospective students to enroll. We tell them all about it, show them just what they are to do, the kind of equipment we have, the material we have to work with; and they know just what they are going to do. We tell you plainly just what you *can* and what you *cannot* do.

8 Because, by comparing the courses of instruction given by this institution, the equipment used in teaching, the personnel, the trained engineers —competent instructors who have been in this business for many years—you will find that you get the best here at a minimum cost.

COME AND SEE OUR MODERN INSTITUTION and convince yourself of our up-to-date facilities for the teaching of AVIATION in the RIGHT WAY.

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REFINING CRUDE OIL

By I. H. SHEARER

SO many people take lubrication as a matter of course. They are of the opinion that oil is oil but I hope to be able to show you the difference between oil and lubrication and prove that oil will be an expense while lubrication will most certainly be an investment. Only a very few have had an opportunity to visit an oil refinery and learn "What it is all about".

The selection of crude is of paramount importance.

Away back in the dark ages, or whenever it was that Mother Nature was experimenting in her laboratory, she discovered a process, secret or otherwise, that enabled her to make a product that has never been equalled although men have tried for more than fifty years to discover something just as good.

Scientists are still debating the origin of crude oil, and whether the prehistoric animals that roamed in this neck of the woods had more green blood in their veins, or the school of fish which infested these parts were better educated, is not known but it is a fact that Bradford Grade of Pennsylvania Crude stands at the top of every crude oil market and has held first place for years.

Perhaps nature, in all its wisdom, realized that there would always be a large number who would buy on a price basis and figured that it would be useless to go to all the necessary trouble and care to make all crude of the same quality so she made enough to satisfy the demands of those who realize the importance of correct lubrication.

Crude oil is composed of numerous hydrocarbons, having different boiling points. As the oil is heated the gasoline, naptha, kerosene and fuel oil are distilled in the form of vapor as their various boiling points are reached. The vapors passing through condensers come in contact with the cold surface of the condenser pipes and are converted into liquids. The product following fuel oil is known as wax distillate, which, as its name indicates, contains wax, or paraffine, and lubricating oil known as neutral for which Pennsylvania crude is famous.

The wax distillate is chilled causing the wax to congeal, and as it is forced through the wax press the crystals adhere to the canvas blankets, with which the press is equipped, while the neutral oil passes through and is again pumped to the still, where it is again distilled and the light products vaporized. These light or non-viscous oils after being filtered are used for lubrication of cream separators or for household purposes such as sewing machines, etc.

The oil remaining in the still is pumped to the filter-house where it is run through Fullers earth. This earth is a mineral and very porous. The oil passing through the pores is cleansed of all impurities or foreign matter and fortunately our crude oil as it comes from the ground contains such a small amount of impurities that no acid or chemical treatment is used or required.

The process just explained produces what is commonly known as a light or medium oil, which for years was sufficiently heavy for all internal combustion requirements, but to meet the lubricating needs of heavy duty automobile, truck, tractor, bus and, last but not least, airplane motors a process was required that would make a heavier bodied motor oil.

Many experiments were made and about eight years ago a process was perfected by which the heavy dark green residue commonly known as steam cylinder oil could be converted into the highest quality and heaviest bodied Pennsylvania motor oil for internal combustion motors. Steam cylinder oil is very high in wax content, but of a different nature than referred to in a prior process. That wax in the cylinder oil is amorphous or without form and its trade name is Petrolatum or Petroleum Jelly.

This method, by the way, was first put into practical operation in the Kendall Refinery at Bradford, Pa., and is known as the Centrifugal Process. Briefly the method of operation is as follows:

The cylinder oil is diluted with naptha so that it will be fluid at low temperatures. This is also filtered through Fullers earth to a predetermined color and chilled to 18 degrees below zero Fahrenheit. When this temperature is reached the oil is run through large centrifuge machines built along the lines of cream separators, only on a much larger scale. These machines turn 17,000 revolutions a minute and separate the petroleum jelly from the oil. The oil is redistilled to drive off the naptha and is finished into a heavy bodied, light colored oil with an exceptionally low cold test and is compounded in various proportions with the neutral oil previously mentioned to make motor oils of different bodies, such as heavy, extra heavy, aviation, etc.

The completeness of this refining process makes the oils cleaner, gives them a lighter body at normal temperature, a slow break down under heat resulting in a correct film at high temperature.

At this point it is advisable to explain the meaning of cold test which, brushing it free from technicalities, means the lowest temperature at which the oil will flow in a small test tube which is about one and one-quarter inches in diameter.

Bradford Crude is one of the many paraffine base crudes and is so called because of the large amount of wax it contains. It so happens that the wax particles do not contaminate the lighter products made from Crude, such as gasoline and kerosene, but predominate in those products from which lubricating oils are manufactured.

None of this product is placed on the market for sale in this condition because of its very high cold test. This, of course, is due to the large amount of wax which would cause it to congeal at an ordinary moderate temperature. This is so objectionable, both to the appearance of the oil and the result which would be obtained, that wax separation becomes a very important process in refining and the cold test will indicate the degree to which the oil has been refined.

The wax which has been extracted is quite hard at moderate temperature, but when it becomes heated it melts and becomes very thin, in fact, much thinner than the oil from which it is extracted. This wax is not a good lubricant and only dilutes the oil, so that the more wax extracted the less diluted or contaminated the oil will be, resulting in a product which changes less in body when it is subjected to temperature changes.

With this lower cold test it will be much easier to start the motor in cold weather, because there are no solid particles of wax to be broken up, and this means that there will be less wear on the motor, to say nothing of saving you the exasperation of starting a so-called balky engine on a cold morning. After you have started the balky engine under these adverse conditions, your mind, undoubtedly, is very much relieved but if you could see the conditions under which this motor is operating you would know that your troubles are not yet over.

If your oil does not pump or flow easily at the temperature at which you are starting the engine, it will be some time before the lubricating system is properly functioning and with the oil which is very sluggish when cold the oil pump cannot circulate it quickly enough and the result is that the motor is operating without oil circulation.

By reason of its light body at normal temperature the oil circulates more freely and instantly reaches every part requiring lubrication before pressure can break through and before metal to metal contact can occur. By retaining its body under heat it effectively seals the pistons, giving better compression, increasing pressure and power, and saving fuel. Every moving part is thoroughly protected by a film that is heat and wear resisting, which reduces friction to a minimum, prevents metal contact and eliminates repairs ordinarily caused by faulty lubrication.

As we previously stated Bradford Grade of Pennsylvania Crude has a paraffine base, but, for your information, wax is not a lubricant, and therefore, its complete elimination such as occurs in this process improves its quality and prolongs its life. If wax is permitted to remain in the oil it will crack or coke when it is subject to the high pressure and high temperature encountered during the operation of the motor. This would form a hard gritty carbon deposit which is difficult to remove, while Kendall Penzbest Motor Oil from which all the wax has been eliminated resists breakdown, the carbon is soft with a much smaller deposit.

This is a rather brief description of a process which requires from two to four weeks to complete, but will give you an idea of the extreme care and vast amount of equipment necessary to refine crude oil.

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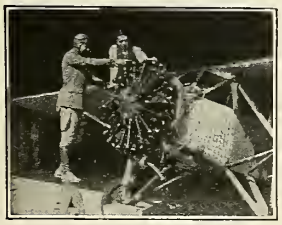
Reading stories and newspaper accounts of the marvelous feats being performed daily by trained aviators won't help you to fly. Come to Parks Air College at St. Louis, where aviation thrives in a hot-bed of stirring, ambitious activities. New factories, new fields, new opportunities await you. Parks Air College is right in the midst of it all. Being affiliated with Parks Air Lines, distributors for Travel Air Planes, this college has unusual facilities and unusual prestige. Here you learn to fly by flying!



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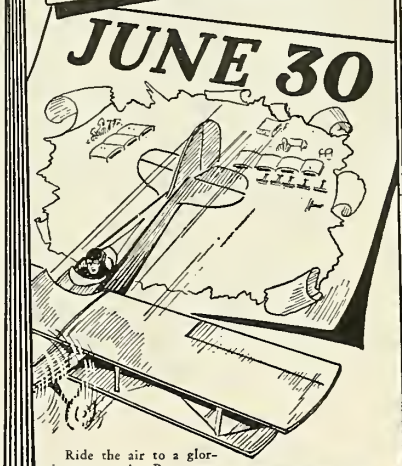
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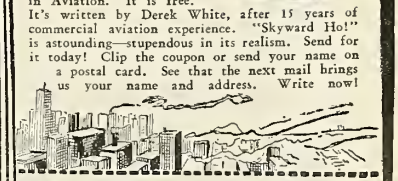




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Derek White, Gen. Mgr., Parks Air College, 202-B Mo. Theatre Bldg., St. Louis, Mo.

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OHIO AIR NEWS

By T. E. Lunsford

THE joint legislative committee on aviation is planning aerial visits to all sections of Ohio during the spring and early summer for the purpose of studying aviation as it exists in the state and its needs for the future. The first trip, covering some of the cities in Southwestern Ohio, will be made in May. In each of the aerial trips it is planned to meet with representative citizens interested in aviation in at least two cities a day.

A subcommittee composed of Chairman Ingalls, Senator L. G. Collister and the executive secretary, Lloyd B. Bower, and preparing a tentative bill to be presented to the next session of the legislature. Besides Chairman Ingalls, the legislative committee is composed of Miles S. Kuhns, Dayton; L. G. Collister, Cleveland; V. D. Emmons, Akron; Martin S. Dodd, Toledo, and Earl J. Johnson, Painesville.

COLUMBUS has been selected as the eastern transfer point in the proposed transcontinental train and plane line. The proposed route is from New York to Los Angeles, by way of Columbus, St. Louis, Dallas and San Antonio.

Under the plan, air and rail passengers from New York for points west will board "The American," crack train of the Pennsylvania R. R., at New York and arrive in Columbus at 8:12 the following morning. At Columbus passengers will be rushed by bus to Norton Field where they will board airplanes and fly during the day to Dallas, Tex., via St. Louis. They will complete the journey from Dallas to Los Angeles by rail at night and plane by day, arriving in Los Angeles in 46 hours from New York. The all rail journey now requires 87 hours.

For the air portion of the journey trimotored planes will be used, flying only in the daytime in order to avoid the hazards of night flying. No mail will be carried in these planes.

THE Columbus Air Board is considering a proposal of the Commercial Airway Transportation Corporation of Ohio to furnish Columbus with an airport for private and commercial planes. A lease has already been secured on the field, which will he on the Louisville-Cleveland air mail route within 12 minutes of the Columbus post office.

FIFTEEN high school boys started a course in the fundamentals of aeronautics at the Akron Y. M. C. A. recently. It was the first meeting of the Lindbergh Club, newest of the Y boys' organizations. C. H. Roath, of the Goodyear Tire & Rubber Co. aeronautical department and author of a textbook used in Army aviation schools, spoke to the boys at the meeting. The Lindbergh Club will meet once a month, the next meeting being the first Tuesday in May, when another Akron aeronautic expert will speak.

THE Alliance Aerial and Aviation School has just started business and a landing field 2,200 feet long and 600 feet wide, lighted and marked in compliance with government regulations, has been established on the General Cox Highway just east of Columbus. C. O. Bell, licensed pilot, is director of the company. Associated with him are Harold Artman and W. C. Baker.



Officials of the International Aircraft Corp., Cincinnati.

Perry V. Ogden, vice pres. and gen. mgr.; H. A. Speer, vice pres., in charge of sales and test pilot of "City of Cincinnati," the first International plane built in Cincinnati; Edwin M. Fisk, designer and engineer.

WILBUR BARR has been named president of the newly organized Ohio Valley Aero Club, which has its headquarters in Wheeling, W. Va., and will teach flying at the Yorktown, O., Field. There are thirty-two charter members of the club.

OPEN house was held by the Massillon Aero Corporation at their plant on Erie St. recently. A finished, two-passenger monoplane, the first attempted by the company, was inspected by the public. The corporation is financed by business men of Massillon and Canton.

OFFICERS and directors of the Dayton Airport, Inc., recently elected are: Frederick B. Patterson, president of the National Cash Register Co., president; Fred H. Rike, vice-president; John F. Ahlers, secretary; Howard F. Marston, treasurer; Lee Warren James, council, and Charles H. Paul, general manager. Directors of the company chosen are: E. G. Biechler, William A. Chryst, James M. Cox, E. A. Deeds, M. J. Gibbons, Jr., John C. Haswell, Frank T. Huffman, Lee Warren James, Charles F. Kettering, Howard F. Marston, George H. Meade, Fred H. Rike, George B. Smith and Frank Hill Smith.

The land on which the new commercial aviation center will be located has a frontage of 2300 feet on the Dixie Highway and comprises 310 acres lying adjacent to the village of Vandalia, about nine miles from the center of Dayton. It has the advantage in location of being reached by both the Dixie and National Highways, two of the great transcontinental arteries for automobile traffic.

THE price of the Waco, equipped with the Curtiss OX5 motor, has been advanced $500 by the Advance Aircraft Co. of Troy. The retail price of the machine now is $2885 with regular equipment. Officers of the company state the increase was made necessary by the increased cost of OX5 motors, the supply of which has been practically exhausted.

OPERATION of the Cleveland-Louisville air mail route will not begin until about May 15. That announcement has been made by City Manager F. O. Eichelberger of Dayton, following a conference with army officers and R. P. Cunningham, Cleveland, on the proposed route. Mr. Cunningham is president of the Continental Air Lines, Inc., the company which will operate the Cleveland-Louisville Line.

STUDENTS and teachers of the Wilbur Wright junior high school, Dayton, O., joined in honoring the birthday of the inventor for which the school was named with a program on April 16. Many celebrities connected with the world of aviation were present at the exercises and joined in paying tribute to Wilbur and Orville Wright, inventors of the airplane.

CLEVELAND AIR NEWS

By David E. Irwin

CLEVELAND, within the next two years, is to have an airport on the lake front, within five minutes of the heart of the city. Legislation is now being drawn up to obtain the necessary land which is to be reclaimed property extending out into the lake 1,100 feet from the present shore line between E. 12th and E. 26th Sts.

The new downtown airport is to have a 2,000-foot frontage and will be operated in conjunction with the present port, which is 9 miles from Public Square. A break wall is to be built to provide calm waters for the landing of seaplanes.

When the downtown port is a reality, passenger planes will land there while the other port will be used for freight and as a general service depot.

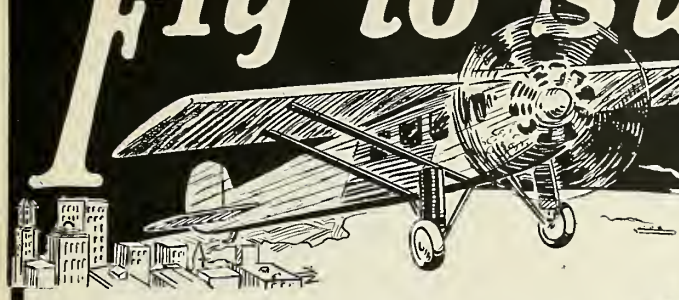
THE Cook Aircraft Co. has been incorporated here with aviation instruction and taxi service as its object. Robert Schafer is president; George D. Sturtevant, Jr., business manager; Roland E. Sturtevant, secretary-treasurer; and Douglas C. Cook, former army flier, operations manager. The company now has four ships, and plans to add two more.

THE Packard Electric Co., of Warren, has purchased a Stinson-Detroiter from the Thompson Aeronautical Corp., Stinson distributors for Ohio and part of Pennsylvania, for visiting its agents and wholesalers throughout the country.

It made its first business flight April 13 when N. A. Wolcott, president, and B. N. MacGregor, sales manager, flew to Detroit, Chicago, South Bend and Indianapolis, Ind.

RICHARD S. HARTILL, Detroit capitalist and president of the Lake St. Helen Club, at Lake St. Helen, Mich., re-

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A. S. T. itself, renders contract air transport, photography and advertising service, operating planes for commercial and pleasure purposes to and from all points radiating from Chicago.

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A. S. T. is constantly making records—soloing 6 to 11 men per week—placing 10 to 20 and even more men in positions each week, thus helping to pay tuition and living expenses—rendering real service.

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(Cleveland News continued)

cently flew to Cleveland to arrange a branch office for the club and to promote air visits to the club, which boasts of two landing fields.

The club is two hours from Detroit by air and a like distance from Cleveland. This summer, week-end air trips are to be made regularly from Detroit, the line hooking up with the Cleveland-Detroit airline.

V. E. JAKL, meteorologist of Chicago, has taken charge of the aerology post at Cleveland airport.

Ground has been leased at Cleveland airport for the government radio station where the new beacon is to be installed, Major John Berry, superintendent of the airport has announced. Meteorological reports are to be received and sent from the station also.

THE *Cleveland News* has opened an aviation department, conducted by L. F. Ross, lieutenant in the aviation corps in France during the World war.

THE Cleveland School of Aviation soon will start manufacturing a monoplane to be equipped with the 220 h.p. Hispano-Suiza motor. Officers of the company are: "Art" Rudenauer, president; E. F. Beckley, vice president and E. J. Standring.

THE Aero Club, of which Willard Parker is president, is to incorporate soon with flying members paying $100 initiation fees and non-flying members $10, with dues of $5 a month for the former and $5 a year for the latter. A hangar with lounging quarters is to be built at the airport.

HANGAR and taxi services is planned by a new company, Dungan-Smith Airways, Inc., organized here with Lieut. H. E. Dungan, Air Corps Reserve, at the head.

Ground school and air instruction will be instituted by the company. Major L. B. Lent and Dr. M. Luckiesh, of the research laboratory of the National Lamp Works, will be instructors. A $25,000 hangar is being built at the airport.

Officers of the company are: Dungan, president and treasurer; Capt. Fred L. Smith, O. N. G., vice president and director of ground school, and Joseph T. Bergeron, secretary.

PILOTS Mack E. North and Harvey Bolich of Cleveland, are spending a month in southern Illinois, on an aerial advertising campaign for the Dover Manufacturing Co., of Dover, O.

They have a loud speaker in their Waco-10 and herald to the country at large the virtues of the company's products.

INABILITY to make Cleveland by dark, the Buffalo planes of Colonial Western Airways, Inc., are now leaving the eastern city at 1:55 p. m. instead of 2:25 p. m. The planes leaving Cleveland were kept on the old schedule of 12:15 p. m.

JACKSON AIR MEET

THE Jackson Chamber of Commerce, cooperating with the municipal authorities, is developing a program for dedication services and an air meet to be held at Reynolds' Field, the new municipal airport at Jackson, Michigan, on June 2nd and 3rd.

This new municipal airport consists of 160 acres, situated west of the city on the main lines of the Michigan Central Railroad and the field is being put in shape and will be completed in time for the dedication.

The field has an open approach, a firm soil with suitable drainage and has no natural hazards or obstructions in taking off or landing. Waiting room and restroom facilities, sleeping quarters for at least five men, and a restaurant will be available. The city will erect one or more hangars.

Adequate repair equipment, fire fighting equipment and first-aid supplies will be installed. Weather bulletins will be issued, ground signals will be installed and the field lighted for night flying.

The east and west runway will be a mile in length and 300 feet wide and the north and south runway will be at least 2,500 feet long and 300 feet wide. Other runways will be developed as soon as possible, which will allow landing and takeoffs in at least eight different directions.

The air meet will be under the supervision of the NAA.

The first event will consist of an "On to Jackson" race with two main cash prizes and entry prizes for all contestants. There will be speed races, parachute jumping and dead stick landing contests, and a "Pony Express Race." Cash prizes will be given for all events.

There are no restrictions offered and the aviation committee of the Jackson chamber of commerce extends to every licensed pilot an invitation to visit Jackson during these two days and enter the contests.

NORTH CAROLINA NEWS

By M. C. Loutt

TWO new and well equipped airports have been added to North Carolina's rapidly growing list—at Lexington and Rocky Mount.

The Lexington field lies adjacent to state highway No. 10 and also on the main line of the Southern and about 3½ miles west of town. It will be used as an intermediate airport by Pitcairn, Inc., and is well lighted. The approaches are comparatively clear, the only obstacle being a group of trees at the northernmost end of the field.

Eagle Airport at Rocky Mount is located about two miles north of town on state highway No. 40 and the Seaboard R. R. This field has excellent approaches and the terrain is good.

At the opening of both of these airports during March, each pilot was presented, through the courtesy of the Kendall Refining Co., with one of Johnson's log books and a free crankcase of Kendall Aviation oil.

Both Lexington and Rocky Mount cordially invite all north and south-bound fliers to use their flying facilities.

SOUTH CAROLINA NEWS

THE Williams Flying Service, owned and operated by Errett Williams, Spartanburg, S. C., has been successfully operating in this state for the past year. With three Eaglerocks they have carried over 6,000 people on short pleasure trips and have flown 22,000 miles on cross-country work without a single accident. As state distributor of the Alexander Aircraft Company they have sold and delivered fifteen new Eaglerocks in the past five months.

They have erected an eight-ship hangar of the individual type on the municipal airport at Spartanburg and have opened a flying school there this spring.

The company has established eleven landing fields in different parts of the state, and find this their greatest asset in the sale of airplanes.

ST. LOUIS AIR NEWS

PARKS Airport at St. Louis consists of over 100 acres of ground located exactly six miles from the heart of the city. It is surrounded by level land and is located in Illinois adjacent to East St. Louis although it is as close to St. Louis as to the Illinois city.

This new flying field and airport will be used by the Parks Air College, Inc., affiliated with Parks Air Lines, Inc., the Illinois and Missouri distributor for Travel Air ships, of which H. P. Mammen is president, Oliver L. Parks, vice-president and Derek White, general manager.

In addition to field office, class room and restaurant, two hangars have been erected and construction is proceeding on two additional hangars. These hangars are being erected by the St. Louis Structural Steel Co. and by the Butler Manufacturing Co. of Kansas City. A 10,500-gallon gasoline tank has been installed on the field.

THE Von Hoffman Aircraft Company has let contracts for the construction of two large hangars for their own use in housing planes and workshops for student instruction. The hangars are to be 80 x 120 feet each and to be made of steel. These hangars are to be equipped with all the modern necessities. They are to be provided with workshops, storeroom for parts, class room for student instruction, both in mechanical and theoretical instruction, and will also house the field office of the company.

The hangars are being constructed on the St. Louis municipal air field at a cost of $25,000 each.

ARKANSAS AIR NEWS

THE Fort Smith Aircraft Company, Fort Smith, was organized a few months ago and is operating an air taxi and sight-seeing service and a flying school from its airport at South Fort Smith.

Officers and directors are: Carl Worty, jr., president; J. L. Price, vice-president; W. Frank Morehead, secretary-treasurer; Captain Ollie Blan, manager of operations and pilot



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BOSTON AIR NEWS

By George W. Hamblin

YOU remember we wrote last month that we had a heck of a dizzy period? Well, in the month just passed we had almost as coocoo a time. What with two new flying companies beginning operations, an old company starting its summer season, and two new ships flown in for the Bay State Flying Service, we have had what one might call a hectic existence. Oh, yes, I almost forgot the flying by local boys up to Murray Bay, but let's take them all in turn.

THE newest airplane company operating from the orphan airport, which might not be an orphan much longer, is Skyways, Inc. Skyways, Inc., are now operating two "Challengers" and a Travel Air, all OX-5 ships. They expect to have a Ryan-Siemens Challenger in June, and a cabin monoplane very shortly. The company officers are: T. W. "Ted" Kenyon, president; Crocker Snow, secretary and chief pilot; Andrew Ivanoff, treasurer; George F. Barry, field manager, and Danny Dugan, ass't. field manager. Burr Leyson is engaged to act as student instructor and pilot.

THE Bay State Flying Service, New England distributors of American Eagle airplanes, took delivery of two of the 1928 models, and Fred Pereira, Adolph Backstrom and Olcott Payson flew the jobs back from the factory at Kansas City.

This company has inaugurated the first regular weekly broadcast over WLOE, the *Boston American* station. This is the first time an hourly program has been sponsored by a commercial airplane company here in Boston. The writer, in his capacity of traffic manager for the company, has been giving short talks along with Pereira during the programs. This feature has proved to be a big business getter.

CAPT. Leroy Ponton "Bon Bon" de Arce, one-time pilot on the air mail, has been engaged to fly for the Old Colony Airways of Revere, Mass. De Arce says the company will work out of Muller Field, Revere, on the International Highway, between Malden and Revere. They will be Eaglerock and Ryan dealers for eastern Mass.

LIEUT. CROCKER SNOW, chief pilot of Skyways, Inc., was up to Murray Bay with photographers during the *Bremen's* stay on Greenly Island. He was the first pilot to get to Murray Bay and obtain pictures of Major Fitzmaurice to get into New York. He was flying a Fairchild owned by the L. and H. Aircraft of Hartford.

COLONIAL AIR TRANSPORT, operators of C.A.M. No. 1, hung up two records during the past two weeks. The first was the fastest trip ever to be made from Hadley Field to Boston, Richard W. Mackie making the trip in one hour and 25 minutes. The second record was 80 odd pounds of mail outgoing from Boston on the night of April 21. This was not a freak performance, but was all solid mail.



Herbert photo.

Lieutenant Donald Duke.

Who's Who at the Boston Airport

Lieut. Donald Duke, Airport Commander

WE have always been fortunate in having as commanders of the airport men who proved without exception to be "good eggs" and men who, at the time of their term of duty here, could do the airport the most good. Recently we had a new commander take over the reins, and he has proved to be the ideal chap for the office at the present time. He is none other than Lieut. Donald Duke, one of the best airways and airport men in the country. He came just in time to fan the glowing embers of interest in the airport to white heat, and has drawn up plans for the new Boston Airport that have met with unanimous approval everywhere.

Beginning his service in the Army in 1917, he was graduated from the School of Military Aeronautics at Austin, Texas on December 15, 1917. On February 18 of the following year he was graduated from the School of Aerial Observers at Post Field, Fort Sill, Oklahoma, and was appointed head of the Department of Aerial Reconnaissance at Post Field for the duration of the war. He was transferred to Luke Field, Honolulu, H. T., and was Commanding Officer of the 6th Observation Squadron in 1919 and 1920 at Luke Field. Lieut. Duke was again transferred to Fort Bliss, Texas, in 1920, where he was C. O. of the 13th Observation Squadron at Kelly Field. He was assistant Air Officer of the 8th Corps Area with headquarters at Fort Sam Houston, Texas in 1922-1923. After a year in that office, he was appointed Chief of the Airways section in the office of the Chief of Air Service from 1924 to 1927, inclusive. He acted as aide to Maj-Gen. Mason M. Patrick, then Chief of Air Service, and made inspection tours over most of the United States. In 1924 Lieut. Duke won the Liberty Engine Trophy Race at Dayton, Ohio. He was appointed Commander of the Boston Airport on March 13, 1928.

Lieut. Duke was born in Danville, Illinois, and was educated in the Danville High School, and at the Lane Institute of Technology at Chicago. The lieutenant is married.

A. LEWIS MAC CLAIN, who has recently been appointed chief pilot of the Boston Airport Corp., has pulled a new one. He has started flying instruction in the wee sma' hours o' the morning. Several Harvard students couldn't get the time to come over for instruction in the afternoons or on the week-end, so Mac stepped into the breach with the proposal that they get over to the port at seven a.m. and take their time. The innovation has caught on to the extent of having seven and eight students reporting.

WHAT is believed to be a new record for the distance between Wichita, Kansas and Boston was hung up by the amiable B. F. Billings, manager of operations of the Airport Corporation, when he flew from the Travel Air factory to Bean Town in 16 hours and 33 minutes. The OXX-6 motor was never revved higher than 1,300, except on take-offs, and that accounts for the fuel consumption of only 6½ gallons per hour. A strong tail wind was blowing all the way, and Billings just sat there and hoicked along.

THE Norwood Flying Service began operations at the new Westwood-Norwood airport on Sunday, April 29. The company is composed of Arnold Chamberlain, Carl Snyder and Aeo Paulan. They have purchased an American Eagle from the Bay State Flying Service. The boys expect to carry on the regular commercial air activities.

WITH the purchase of two 1928 American Eagles from the Bay State Flying Service, the Amesbury Airways Corp. announces its entrance into commercial flying. This new company expects to begin operations along about the middle of May.

Harry Finnell is president of the Amesbury Airways corporation; Lester McLinn, vice president; James Dickens, treasurer, and Malcolm Hardy, secretary. Their field lies one-half mile east of Amesbury, on the Amesbury-Haverhill turnpike.

EDWARD T. O'TOOLE, Boston's oldest commercial flying operator, has begun operations with a Waco-10, and expects two more ships very shortly. He is at present operating from the airport in Boston, and has a five-year lease on a field in Martha's Vineyard, on which Eddie will operate a flying school. A large twenty-room house goes with the lease, and the students will use this for a dormitory. It is also planned by O'Toole to operate in Portsmouth, N. H.

Lawrence Air Meet

THE National Air Pageant Association, with the announcement of the first air meet to be held in Lawrence, Mass., June 1, 2 and 3, begins operations for the season. This association is headed by Harland F. Banks and Kester Lindsay.

After running several successful meets last summer, Mr. Banks is going to go into the business with a vengeance, declaring that there is plenty of need for air meets in the different parts of New England, and that he will put on first class shows.

NATIONAL AIR PAGEANT ASSOCIATION

announces the opening of its 1928 program for the advancement of commercial aviation, with the holding of the first of a series of large air meets at

LAWRENCE, MASS., JUNE 1st, 2nd, 3rd

THIS organization is completely equipped and has a well trained personnel for the successful dedication of airports, and for the promotion of all phases of commercial aviation. If you are planning to finance, build or dedicate an airport in your city, see us first.

NATIONAL AIR PAGEANT ASS'N

971 Commonwealth Ave. Boston, Mass.

New England Distributors for the Finest— the Ryan Brougham and Eaglerock Biplane

MASSACHUSETTS AIRWAYS CORPORATION
1597 Main Street — Suite 303
Springfield, Mass.

This organization operates New England's most modern and complete aviation school. Flying and mechanics' instruction for the layman or advanced student.

Passenger and Freight Carrying—*Anywhere, Anytime*—Aerial Photography

The Most Comprehensive Aerial Service in New England

FLYING FIELD: Agawam Center

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FLYING FIELD: Westfield, Mass.

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FLIGHT INSTRUCTION
PASSENGER SERVICE
"Learn to Fly in your own neighborhood"
Operating from Muller's Field
P. O. BOX 285
REVERE, MASS.

Rollins Aerial Service
We carry passengers and freight to any point — punctually.
STUDENT TRAINING
AERIAL PHOTOGRAPHY
60 Fenway St. BOSTON
Flying Field: Prior's Airport, South Easton, Mass.

Joseph Baltrun
Instruction in
Flight *Motor Assembly*
Fuselage Construction
and all the fine points of flying
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ATLANTIC AIRPORT, INC.
92 Granite St., Westerly, R. I.
58 Greenmanville Ave. Mystic, Conn.
Seasoned pilots and mechanicians amply qualified, through years of contact with aviation, to *"teach Rhode Island and Connecticut to fly"*.
Also passenger carrying and aerial photography.
FLYING FIELD AT CHARLESTOWN, R. I.

RHODE ISLAND AIRWAYS, INC.
97 Commodore St.,
Providence, R. I.
Fly in comfort—anywhere, any time.
Learn to fly from competent instructors.
FLYING FIELD, PROVIDENCE, R. I.

WORCESTER AIR NEWS

By Charles H. Chambers

GEORGE J. HAVEN of the M. E. Tuller Co., distributors of Nash Automobiles in Worcester County, who has taken an active interest in flying and the promotion of aeronautics in this section received his commercial license last month.

Through his association with the M. E. Tuller Company as manager of the Used Car division, Mr. Haven has expanded aviation in that field, offering a free air ride to purchasers of automobiles. He reports a thriving business as a result of this offer by his firm and has caused many motorists to become interested in aviation and in the Worcester Airport at Whittall Field.

THE Worcester Flying Club, J. Henry Reynolds, president, has taken delivery of an OX5 Waco. The club has utilized a field owned by one of its members, Dr. E. E. Smith, in Oxford, and has carried many passengers in that vicinity. The club eventually plans to place the Oxford field in condition as an auxiliary landing field and to maintain it as their home port. For the present the new plane is being housed with several others at the Worcester port.

EIGHT planes now make the Whittall Field port their permanent habitat. Among the new planes at the port is a Ryan Siemens engined Waco-10 owned by Henry Bradford of Bennington, Vermont.

M. Whitin Whittall's Fairchild cabin monoplane is the largest locally owned ship and the smallest is the Driggs-Dart owned by his brother James P. Whittall.

Other planes at the field are all Wacos and are owned by George J. Haven, the Worcester Flying Club, Henry Bradford of Bennington, Vermont, Samuel Rollinson of Lowell, and the two ships of the New England Aircraft Corp.

BARNES AIRPORT

Westfield, Mass.

DEVELOPMENT of the Barnes Airport located at Westfield, Mass., is progressing rapidly. Last fall the field was enlarged to four times the size of the original field which has been used as an airport for five years.

The airport is under the supervision of a Board of Managers representing the Chambers of Commerce of Westfield and Holyoke.

The Austin Company of New York City has erected a permanent brick hangar 80 x 60 ft. On the north side of the hangar is a lean-to, 12 x 60 ft., which is sub-divided into office, rest room, and repair shop. The floor and the apron are of re-enforced cement. The field is all runway, measuring in most directions nearly 3000 ft. All poles and other obstructions have been removed.

The Board of Managers, of which P. N. Hall of Westfield is secretary, is planning a Dedication Pageant to take place during the month of May.

CAMBRIDGE JR. COLLEGE AVIATION COURSE

SCHOOLS and colleges are beginning to realize the advantage of teaching aviation. The Cambridge Junior College at Williamstown, Mass., was one of the first to give the boys actual practice in flying with a thorough groundwork in theory.

During the summer a short course of eight weeks is given. The term begins July 6th and ends September 6th, although a boy may enroll at any time during the summer. The summer course is particularly adapted to preparatory and high school students who wish to take regular college entrance subjects in addition to aviation.

The junior department is for boys from 10 to 14. They are taught to make models of airplanes and are given as much theory as they can understand. Athletics are also provided. W. Garrett Conant is president of the college.

BUFFALO AIR NEWS

By B. C. Webster

GENERAL Aircraft Corporation located in Buffalo during early April and already is manufacturing commercial planes.

George H. Hannum, former president of the Oakland Division of General Motors, is head of the new aircraft company. G. MacLean Gardner is general factory manager of the company. He was formerly engineer and designer for the Atlantic Aircraft Co. at Hasbrouck Heights, N. J. He came to Buffalo with a force of 25 men, including A. F. Arcier, who was chief engineer for the Atlantic Aircraft Co. Mr. Arcier will be chief engineer for the new company.

THE Chamber of Commerce in demonstrating its interest in promoting Buffalo as a center for national aircraft manufacture elected a committee and vested in it full power to "go out after more laurels for Buffalo." Those on the committee are: Phillip F. Metz, Fred L. Rowe, Ansley W. Sawyer, Postmaster R. W. Gallagher, Edwin Ronne, R. B. Taylor, Kenneth A. Wood, George P. Urban, George Waite, Timothy Burns, A. J. Elias, Seymour Knox, T. C. Knight, C. Roy Keys, Ganson Depew, and Ralph Badger, chairman.

MERLE A. MOLTROP, flying mail between Buffalo and Cleveland, made a new speed record between the two cities, a distance of 200 miles, when he travelled it in 79 minutes. The original record, made by Jack Little, was 85 minutes. Moltrop carried a passenger and 30 pounds of mail.

CITY Commissioner James Moore said he will send a bill before the council asking for the construction of a new hangar at the airport. His specifications call for a $40,000 structure that will be used chiefly to harbor planes en route through Buffalo.

OFFICIAL Department of Commerce statistics show that Buffalo led the nation in production of fighting aircraft for Army and Navy during the fiscal year ending June 30, last. Buffalo contributed 392 military craft.

UTICA AIR NEWS

By Harry Ward Seward

PILOTS flying over Central New York are welcome in Utica. The city recently has approved a bond issue, the proceeds of which are to be used for the purchase of land for an airport and the laying out of the property so that ships may land from all points.

Utica's municipal airport is almost midway between Utica and Rome on the main concrete highway and adjoins the New York State March Hospital property. It is just 7.4 miles from the Utica post office by automobile. One runway diagonally across the field will be 4,000 feet long and another 4,200 feet in length.

A number of Uticans for sometime have been interested in giving Utica air harbor facilities, but it remained for Utica Post 229 of the American Legion to go ahead and make it possible. An aviation committee headed by Reginald I. Heath of the Citizens Trust Company, a member of the Royal Flying Corps during the World War, investigated the surrounding territory and decided upon this site. A large hangar, suitable to house several planes, will be erected. Arrangements are being made for air mail planes to stop at the airport and give Utica and surrounding towns and cities the necessary service.

NEW YORK AIR NEWS

THE Barrett Airways field at Armonk, New York, just north of the Kensico Dam on Route 22, is a favorite stop for motorists on week-end trips. Ten planes operate out of this field at the present time. The company operates for their flying service and student instruction two new Travel Air biplanes. In addition to the two Travel Airs, there may be found in the hangar: one American Eagle, one Eaglerock, two Curtiss JN4DS, three Daimler-Klemm low-winged two-passenger monoplanes, recently imported from Germany by George Kern, and a Laird Whirlwind biplane.

Messrs. Terletzky and Sherman, both pilots, operate the field. Barrett Airways have a fully equipped photographic laboratory and are equipped to handle all kinds of aerial photography, surveys and advertising.

THE Air Cadets of America, with National headquarters in New York City, is an organization that promotes aviation among the youth of the country by giving them instruction in model building and actual construction and flying of aircraft.

Squadrons are formed in different cities where weekly meetings are held for lectures and work on models. There are two classes —the Juniors whose age is from 12 to 16 and the Senior Cadets from 17 up.

The cadets have a junior Airport and summer camp located at New Brunswick, N. J., near Hadley Field.

THE Bronx Aero Club has changed its name and is now known as the Bronx Flying Club of New York City, Inc., and has

(*Continued on next page*)

FIRST ANNUAL WESTCHESTER SEAPLANE RACE MEET JULY 11th & 12th, 1928

Sanctioned by the National Aeronautical Association

Under the auspices of Playland, Westchester County Park System

Sandy, well protected beach.

Ample police guards. Every facility for the care of seaplanes and flying boats is offered free of charge to all contestants.

PRIZES

Handsome organization trophies and pilots' prizes for military events. Cash and pilots' prizes for civilian contests.

RESERVE THESE DATES

Free entertainment Q. B. Headquarters

Entries are now being received by the

Seaplane Race Committee

WESTCHESTER COUNTY PARK SYSTEM

Playland Rye, N. Y.

(New York News continued)

been incorporated under the laws of the State of New York. Meetings are held every Wednesday evening at 8 p. m. at Evander Childs High School, 184th St. and Creston Ave., Bronx.

THEA RASCHE, noted German aviatrix who was in America last year, has purchased the Stinson Detroiter *Adelaide* with which it is rumored she expects to fly from America to Germany with the noted German pilot, Udet.

AIR ASSOCIATES has bought a D.H. Moth with Handley Page slotted wings which will be set up and flying around May 5th.

AT Beacon, N. Y., in the Hudson River valley, a new flying field has recently been opened and will be operated by Beacon Airways, Inc.

Vito J. Marelgno is president and Olen Olsen, general manager of the new company. A field of 168 acres has been purchased on which two hangars are being erected. A field office and accommodations for students at the flying school have been built.

"Vito" served for four years with the Italian Air force during the war. He was in the Caproni Aircraft organization in Italy for nine years and brings to the company a great deal of valuable practical experience.

GATES Flying Circus & Aviation Corp. of Newark, has been awarded the distribution rights for the Challenger airplanes in Northern New Jersey and Southern New York, which includes the metropolitan New York area.

During the first ten days that the company had the agency they sold ten Challengers.

Hull Bros. Inc. of New York City, operators of flying fields at New Vernon and Orange, N. J. have been appointed sub-agents.

Airport Construction Co. Building Albany Airport

THE Airport Construction Company of New York City are building the new Albany airport. The 225-acre field is situated six miles southwest of Albany and can be reached in 15 minutes by bus from the heart of the city. Two hangars 80 x 100 and a large administration building will be constructed. The airport is designed to conform with the Department of Commerce requirements for Grade AAA fields.

The runways will lay in a northerly and southerly direction. Instead of right angled runways, they will be put down in the shape of an X. The first runway will be 400 feet wide and 1,500 feet long and will be seeded. The whole airport will be graded and drained.

The Airport Construction Company recently merged with the William E. Arthur Company and the National Airway Terminals, Inc., of New York. According to H. C. Ferguson, general manager of the National Airway Terminals, this consolidation will create one of the strongest financial group of designers, builders, pilots and operators in the country and will afford cheaper operation under the chain plan.

NEW JERSEY NEWS

By Horace T. G. Bush

ON the highway about midway between Hackensack and Paterson is an ideal location for a flying field and here is located the latest of New Jersey Flying fields, the "Bergen Skyways" who are doing passenger hops and student instructions.

Joseph R. James is the chief pilot and operating manager at this field. Mr. James has had well over 1,500 hours in the air.

The Drews Brothers, John C. and Henry C. will have the passenger rights on this field, using Waco-10s.

A 45 x 80 hangar will be erected accomodating four ships, and also a ground school classroom, refreshment stands, gas and oil pumps, and an operations office.

The field consists of about 60 acres with runways down a slight hill in almost any direction. The two main runways about 1,800 ft. long are into the prevailing winds which in this locality are south and southwest.

ON April 6th a group of five air-minded citizens of the Rutherford, N. J. district met at the home of your correspondent for the purpose of organizing an aero club.

Of these five members, officers were selected as follows: Horace T. G. Bush of Rutherford, president; James Leighton of Hasbrouck Heights, vice president; Wm. P. Koffeberger of Carlstadt, secretary; Herman Kretzmen, treasurer and Stuart Atkinson, sergeant at arms. Since organization meeting the club has grown to thirty members.

New Buildings For Wright Factory

A CONTRACT was signed recently for the erection of a four-story building adjoining the original home of the Wright Aeronautical Corporation of Lewis Street, Paterson, N. J. This structure will contain 100,000 square feet of manufacturing floor space. The basement of this building will be occupied by a cafeteria, a hospital and an employment department for the entire personnel of the Wright Company. The first, second and third floor will contain machine tools and new equipment for the production of the famous "J" series of engines. The fourth or top floor will be used as an office for executives, sales and engineering personnel which are at present housed in temporary quarters apart from their main plant. With the necessary equipment, this new addition will represent a total investment of more than three-quarters of a million dollars.

Construction work has been practically completed on a separate assembly and test plant containing 60,000 square feet of floor space. This new building, which is one story in height, has cost, with equipment, approximately $400,000 and will be used by the assembly, test, service and shipping departments.

The original four-story Wright plant on Lewis Street containing 90,000 square feet and representing an investment of about $325,000 will be reconstructed under the new manufacturing plan so that each department will have ample room for additional expansion as time goes on.

WEST VIRGINIA NEWS

THE Aero Club of Charleston was incorporated under the state laws of West Virginia last October.

Club officers and trustees are ex-service men who have had time in the air, or in other military branches of the service, five of them being licensed pilots of the Air Corps. They are: president, James J. Cabot; vice-president, Walter E. Irwin; secretary, H. F. Milbee; treasurer, E. H. Ross. The trustees are: George Mathis, jr., Lowell Childress and George Smith. Howard Mays is chief pilot of the club.

The total membershhip of the club is forty-three members. Headquarters of the secretary of the Club is located in the Ruffner Hotel.

The flying field is located six miles from the city between the city of Charleston and the city of Dunbar. Construction of two hangars and a club house is under way. There will be gasoline and oil available for all visiting airmen, and the club extends the use of the field to the city as a commercial airport.

Langin Field, Moundsville

ALTHOUGH the government has given up Langin Field as the principal midway point on the model airway between Dayton, Ohio, and Washington, D. C., the field is still capable of taking care of any and all ships that wish to land at Moundsville. The field is in good shape and the steel hangar on the field is open to all visiting airmen. Gasoline and oil may be procured, also the services of licensed mechanics.

The field is easy to locate. It is close by the river which makes it a possible landing for seaplanes also. The hangar is painted red with the roof marked in large, white letters, "Langin Field." The prevailing winds are north and south.

FLORIDA AIR NEWS

By Norma A. Davis

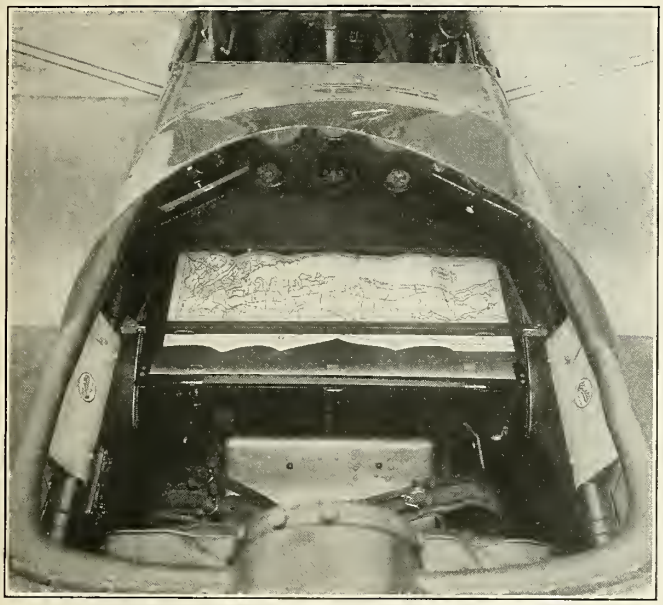
GAR WOOD, international speedboat enthusiast, has augmented his high speed boats with one of the fastest privately owned seaplanes in the world.

After making a trip from Amityville, N. Y., to Miami in 15 hours and a few minutes this week, Mr. Wood has decided to leave his boats behind him this summer when he and his family take their vacation in British Columbia. He will fly to his Detroit home about May 1 with his pilot, George W. Cobb.

Built especially for him, Mr. Wood's seaplane is a Fairchild cabin monoplane with a 410 horsepower Pratt & Whitney Wasp motor, equipped with special instruments.

TWENTY-THREE naval planes which have been spending the winter in maneuvers at Guantanamo Bay, Cuba, arrived in Miami during April en route to their base in Hampton Roads, Va. Lieut. Comdr. Wadleigh Capehart was in charge of the torpedo and observation planes and Lieut. Comdr. K. McGinnis, commander of the VJ squadron 2S.

Let a Socony road map be your guide



Interior of the cockpit of a special Curtiss "Falcon" plane. Note the Socony road map under the glass top of the map desk.

FOR accurate identification of highways, waterways and towns, many aviators find a Socony road map fills the bill perfectly. Ask for a map of Long Island, New York State, or New England at any Socony gasoline station; or write the Socony Touring Service, 26 Broadway, New York City.

A Socony road map is a worthy companion of Socony Aviation Gasoline and Socony Air-Craft Oil. The map points out the course. The gasoline and motor oil take you there in safety. All three have behind them the guarantee of the Standard Oil Company of New York.

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AVIATION GASOLINE
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A Complete Range
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AIRPLANE FINISHING MATERIALS

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including

Dope-proof paint, black, white, aluminum or grey
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Pigmented nitrate dopes
Flexible wing lacquer
Wood and metal lacquers
(for inside and outside finish)

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Contractors to the United States Government

Say you saw it in AERO DIGEST

DETROIT AIR NEWS

By Frank Bogart

JOINT announcement by the Ford Motor Company and Stout Air Services, Inc., that passenger air service between Detroit and Chicago is to be started this month as soon as new equipment can come through the Ford plane factory, marked the third anniversary, April 13, of Henry Ford's entry into the commercial aviation field.

Ford freight carrying planes have flown more than 1,000,000 miles in the last three years. A few months after the company's private service was inaugurated the Stout Metal Airplane Company was bought and absorbed into the company as a separate division. The Ford-Stout trimotor transports are now being produced at the rate of one a week and many unfilled orders are still ahead.

The date for the Chicago passenger line to start could not be definitely fixed when the announcement was made but it is believed it will not be later than June 1. Only one round trip a day will be made at the outset. The fare will be $35 each way. Stout Air Services is now operating a passenger airline between here and Cleveland. On April 18, 56 persons were carried. Stanley E. Knauss, general manager, believes this is an American record for a regularly scheduled line. It was the first time since the line started last November 1 that its full capacity has been utilized. Since April 1 traffic has been running between 35 and 40 persons daily.

EDWARD S. EVANS, chairman of the aviation committee of the Board of Commerce, and holder of the round-the-world-speed record, left April 25 on a three-weeks' business flight through the Southwest and the West in a Stinson-Detroiter.

MORE than 300 visitors at the All-American aircraft show arrived in Detroit by air. During the week of the show 202 commercial planes landed at Ford airport. Several score remained there throughout the week for demonstration flights in connection with the show. An average of 5,000 persons visited the airport daily during "Aviation Week." Twenty-one cities, from Winston-Salem, N. C., to Oakland, Calif., sent delegations here to view the $500,000 aircraft display, which had more than 100 different exhibits. The paid attendance passed 135,000, far outstripping the largest national motor car show attendance ever piled up here.

J. M. JOHNSON, one of the veteran American commercial pilots, has resigned his post as Department of Commerce inspector of aircraft for the Michigan-Ohio district to join the sales staff of the Buhl Aircraft Corporation and will leave the company's plant at Marysville this month in one of their new models on a country-wide tour. Buhl is bringing out two models in its airsedan line. These will be called the Special and the Junior airsedans. Detroit's newest aircraft motor, the Warner "Scarab," 110 horsepower, radial, air-cooled, will power these.

LEONARD M. FLO, pilot of "The Wisebirds, Inc.," for more than a year, has resigned to set up a flying school at Ann Arbor, Mich., where he will also operate the new municipal airport. Flo's Ann Arbor address is 511 Miller road. In giving flight instruction Flo will work closely with the University of Michigan authorities.

CLIFF R. WILSON, president of the "Hummingbirds," one of several new non-profit flying clubs organized here recently, announces the purchase of an Eaglerock plane. His club has 32 members and hopes to be located on a permanent field by June 1.

PRODUCTION of beacon lights by the Bellows Claude Neon company has been started at its Detroit plant. One of the globular models will be placed atop Detroit's newest skyscraper, the Penobscot, 47 stories, 658 feet tall, now nearing completion.

THE Detroit-Toledo airway night lighting installation will be completed this month, permitting inauguration of night connections with the transcontinental mail lines. At present less than one per cent of Detroit's weekly volume of 5,000,000 letters travels by air because of poor connections in effect on the day shuttle service between here and Cleveland.

NORTH CENTRAL NEWS

By Harold Alexander

THE Arrowhead Aircraft Company of Minneapolis is the distributor of the Monocoupe in Minnesota, South Dakota and Montana. Shortly after the franchise was received in January the Central States Aero Company of Davenport, Iowa, manufacturers of the Monocoupe, was reorganized. This change in the organization handicapped the activities of the dealers and distributors to a certain extent, but the ships are now being produced by the Mono Aircraft, Inc. of Moline, Illinois, which should assure the carrying out of proposed plans There have been several changes in the design and construction of the plane and the company is working on a new motor, which has been successful in the various tests. The Arrowhead Aircraft Company expect to have a new Monocoupe in Minneapolis sometime in May for demonstrations to interested prospects.

HERMAN BANNING, that colored flier of Ames, Iowa, had his *Humming Bird* rebuilt at the White Aircraft Company of Des Moines and is now using it to carry on his activities.

The Gerbracht Aeronautic Corporation has leased a 40-acre field two miles south of Ames on the Jefferson Highways.

This organization is the Travel Air distributor in Iowa in addition to their commercial air service.

THE Minn-Wis-Sippi (a combination of Minnesota, Wisconsin and Mississippi) Airway, Inc., of Winona, Minn., will act as a dealer for the Driggs-Dart in addition to their Travel Air agency. The same territory will be covered in the sale of both types of ships and includes the following cities: Austin, Rochester, Albert Lea, Mankoto, Owatonna, Wabasha, Red Wing, Lake City and several others of lesser importance. The officers of this commercial aviation organization are the president and treasurer, B. J. Johnson; vice-president, George Pelowski and the secretary, Chester Ritt, of Winona. In addition to their agency for the two planes the Minn-Wis-Sippi Airway, Inc. will carry passengers, give flying instructions and sell aircraft accessories.

THE Roth-Downs Airways, Inc. of St. Paul, Travel Air distributor in Minnesota, has taken over the flying privileges of the Curtiss field, which was recently purchased by the William S. Kling Co. This

(Continued on next page)

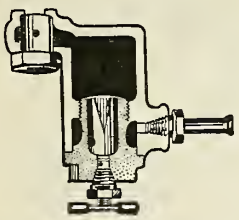


Faculty and officers of the Michigan State Aviation School, Detroit, Mich.

Left to right: Jack Workman, pilot and ground training instructor; F. S. Carr, instructor on engines and block testing; W. R. Wagoner, instructor, electricity and ignition; L. N. DeBurger, pilot and parachute instructor; Dwight Davis, advertising and promotion; "Pat" Tuohey, chief pilot and flying instructor; L. G. Hinton, instructor, theory and design of engines; C. O. Bunnell, principal and instructor; A. G. Zeller, president; Andrew Koski, asst. instructor in ground training and rigging.

Real Values from Nicholas - Beazley!

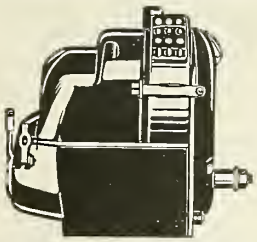
Jobel Gas Strainer



A real necessity for safety and smooth running. Clean gas is essential; with the Jobel strainer you can be sure it reaches your motor free from sediment or impurities.

Specially Designed for the OX5 Engine and has been standard equipment for the past two years on the Waco planes. All materials in this strainer are in accordance with Air Service Specifications. No changes of either carburetor or fuel line are necessary when installing this strainer on OX5 engines. Price, ready to install, each, **$5.**

Scintilla Magnetos



The recognized best among leading manufacturers throughout the world, their quality is too well known to require further description. We carry a complete stock, and can make immediate shipment. Order direct from this ad.

Type A. G-8-D for Curtiss OX5, each $135.00

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American Hammered Piston Rings



Regardless of what you pay, you'll find no better rings than American Hammered Piston Rings. Supplied in both compression and oil-slot types. One piece, easily installed, absolutely concentric. They are accurately machined to fit piston groove and cylinder, making them leakless.

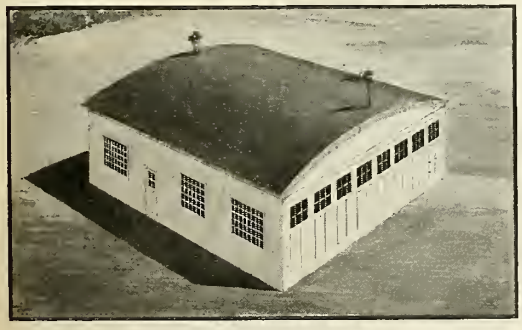
OX5 Standard size, 4" x .280, each	$ .25
OX5 .003 oversize in width, each	.25
OXX6 Standard size, 4¼" x .280, each	.30
OXX6 .003 oversize in width, each	.30
Hisso, A, E & I, 4.724 x .098 Compression ring, each	.40
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BE the first in your locality to get started in this new profit-making business.

Hangar accommodations in your field will pay you real dividends. Flyers appreciate the opportunity of landing on a field equipped with Kocher Hangars, for they know their planes will be securely housed during their stop over.

The Kocher Hangars are designed for substantial and convenient construction. Can be had in many sizes and styles for all makes of planes.

Complete and comprehensive blue prints furnished with every order, together with instructions for assembling. Any handy man can assemble a Kocher Wood Hangar, and they are sold at a price you can afford to pay.

The rental of one or more Kocher Hangars will pay for your plane in a short time.

Write today for complete information and prices. They are yours for the asking. The coupon below is for your convenience.

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Geo. T. Kocher Co.,
226 S. Jackson St.,
Lima, Ohio.

Please send me full information and prices on Kocher Wood Hangars.

Name .....

Address .....

Town..... *State*.....

(North Central News continued)

property, which is located at Snelling and Larpenter Avenues in the capitol city, was the first flying field in the Twin Cities. This site is L-shaped, having a 500 x 2,500 foot east-west runway and a short one running north-south of about 500 x 900 foot dimensions. As this airport is conveniently reached from either Minneapolis or St. Paul by way of the paved roads bordering the field, it will be a popular place during the busy flying season. Many improvements have been made.

SINCE the Northwest Aircraft Show has been postponed a month the Pioneer Press and Dispatch have likewise changed the date of the model airplane contest to May 26th, the final day of the exhibition. The Boy Scout contest, with entries restricted to the scouts, will be held on the preceding Saturday and the city playgrounds department is sponsoring another in June.

THE Mankato, Minn. Chamber of Commerce has authorized its aviation committee to lease a tract of land outside the city limits that will be used as a flying field. This site of about 107 acres will have four runways, three of them allowing more than 2,400 feet run of the ships before their take off. Hangars will be erected, the field will be conditioned and the necessary improvements will be made so as to be available to those desiring to use the facilities. M. E. Bowen is chairman of the committee arranging for the leasing and maintenance of the property and equipment.

A NUMBER of the members of the Milwaukee Sales Managers Association made a trip to Chicago during the middle of April in twenty-one ships. On arrival at Chicago the members were greeted by and were the guests of the Chicago Sales Managers Association.

THE Davenport Airport, Inc., Waco dealer, is operating two 1928 model Wacos and a Jenny at their field in Davenport, Iowa. On the 50-acre L-shaped site is a two-ship hangar with telephone and telegraph connections. Repairs can be made at the field and Standard Oil Company's products are distributed. Lawrence Pedigo is the chief pilot of this organization, with Leo Brennan as the flying instructor.

A DELEGATION of citizens from Cedar Rapids, Iowa, appeared before second assistant postmaster general Irving Glover asking that the air mail route operated by the Boeing Air Transport be changed from Iowa City to Cedar Rapids. The group, which was headed by Vernon Marshall, Cedar Rapids publisher, claimed that more air mail originated at their city than at the present stop on the airline. The claim of the petitioners was opposed by Senator Brookhart, representatives Letts, Dowell and Ramseyer. Representative Cole appeared in behalf of Cedar Rapids. The assistant postmaster general and assistant secretary of commerce W. P. MacCracken, Jr., have taken the matter under consideration.

THE Hamilton Metalplane Co. of Milwaukee recently sold eight enclosed cabin monoplanes. One of these will be used by the Andean National Co. of Toronto, Canada, to carry silver coin to the workmen on rubber plantations and at oil wells in Central America. Another was the ship that was on display at the All-American show in Detroit and delivered shortly thereafter to Neil Norris of Big Bend, Wisconsin, where he has established a landing field on his farm. The remaining six will be used by a Chicago concern on a new air mail and passenger line out of the Windy City.

JOHN JOHNSON was elected president of the Farm School Aviators, membership of which consists of former mechanics stationed at the University of Minnesota College of Agriculture during the World War. One hundred men were present at the St. Francis hotel in St. Paul when the following additional officers were elected: top sergeant, Tom Sargent; company clerk, William Coleman; right guide, Judge Clayton Parks; left guide, L. O. Anderson; mess sergeant, O. C. Rockey; supply clerk, O. C. Carlson; first dog robber, Ruben Hanson; second dog robber, H. C. Hewson and third dog robber, Ralph Purdy.

THE Lincoln School of Aviation, one of the oldest flying schools in the middle west, has secured the services of Harold Phillips, who will be in charge of the ground work and repairing.

The school is still operating on the old Page field, Lincoln, Nebr. and with A. R. Leckscheid as chief pilot they expect a very successful year.

NORTHWEST AIRCRAFT SHOW POSTPONED

THE Northwest Aircraft Show, which was announced in the April issue of AERO DIGEST, has been postponed from April 26-27-28 to May 24-25-26. Instead of being held at the St. Paul Municipal Airport as originally intended, the exhibition will take place at the Wold-Chamberlain Field in Minneapolis. The St. Paul field is being filled in and dredged so it will not be ready to use for the show, thus the change in location.

MINNESOTA AIR NEWS

By W. S. SCHLEY, JR.

FIGHTING an April snowstorm and a persistent jinx that had pursued him in earlier attempts, Gene Shank, St. Paul law student pilot, April 13, established a world's endurance record for light type planes.

The wings of his OX-5 Waco 10, *Willoco*, weighted down by snow, Shank kept his ship in the air for 14 hours and 28 minutes, to better the former record for planes of less than 100 horsepower by one hour and 50 minutes. He was in the air from 6:50 p. m., April 12, until 9:18 a. m., April 13.

Shank's flight was checked by Stanley Partridge of Minneapolis and C. B. McConville of St. Paul representing the N. A. A. The flight was backed by Ernest L. Guttersen, vice-president of the Wilhelm Oil Company of St. Paul.

THE City of Minneapolis was assured on April 18 of becoming a leading aviation center through the establishment there of one of the finest municipal airports in the United States.

The park board of that city acted to acquire the Wold-Chamberlain field of 288 acres, under a compromise agreement with Guy Thomas, head of the Snelling field corporation, owners of the property.

These 288 acres, together with adjacent property already acquired through condemnation proceedings, will provide a total area of 325 acres as the site of the municipal airport. The price to be paid for the Wold-Chamberlain field and adjacent property will be approximately $190,000.

PLANS for the Twin Cities to Crookston air derby which is to be May 26-27, having been postponed from November, are being made there. A good-will tour to Winnipeg, Canada, is planned for May 28 in which American and Canadian planes will participate. The race from the Twin Cities calls for a stop at Little Falls, Minn.

AIR express service for the Twin Cities was opened April 3 when two Northwest Airways planes took off loaded with more than 90 first flight packages, from the Wold-Chamberlain field and the St. Paul Municipal airport for Chicago.

The new service connects the Twin Cities express with Boston, New York, Hartford, Cleveland, Moline, Davenport, Rock Island, Kansas City, Wichita, Oklahoma, Fort Worth, Dallas, Omaha, Cheyenne, Salt Lake City, Reno, Sacramento, Oakland, San Francisco, and Los Angeles.

FAIRMONT was assured a new airport April 11. The Aviation Improvement Association announced that land just outside the Fairmont City limits has been procured for the project. The association, composed of Fairmont business men, is ready to purchase the site, which is 2,000 feet long and 300 feet wide, extending along Highway No. 9.

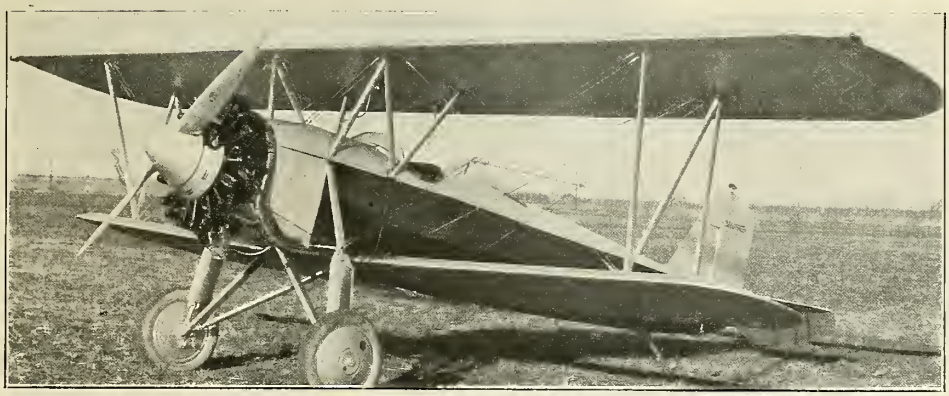
PLANS for an air derby, the establishment of an airport at Montevideo, and the organization of an aero club were discussed at a meeting April 12, by the local chamber of commerce and officers of the American Legion of that city. May 19 and 20 were the days selected for the air meet, which will be sponsored by the legion, and endorsed by the chamber of commerce.

DELEGATIONS from the Twin Cities, Mankato, Marshall, and other Minnesota communities flew to Huron, S. D., March 30th to attend the cities' first airways rally.

Establishment of aerial transportation routes in the Northwest on a systematic commercial basis and construction of airports were the aims of the rally at which H. H. Blee, chief of the airport section of the Department of Commerce, spoke.

A temporary landing field provided for the visiting planes was patrolled by National Guardsmen during the rally.

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WICHITA KANSAS

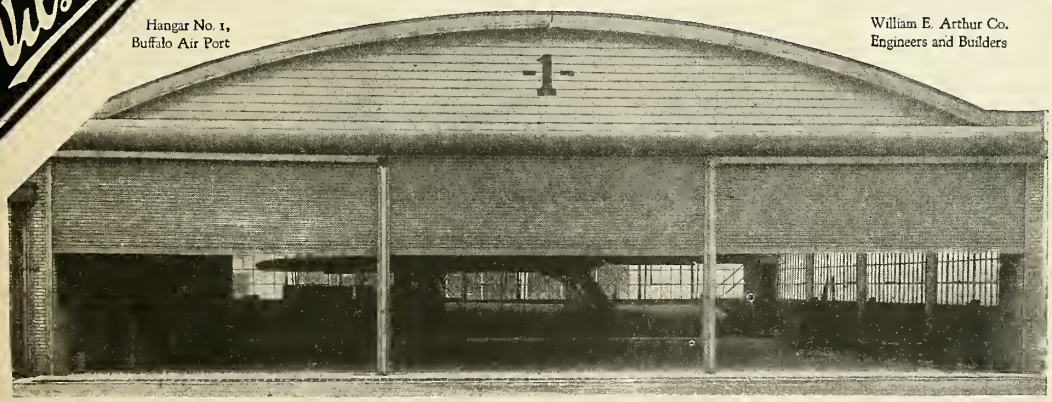
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OVER FIFTY YEARS IN BUSINESS

INDIANA AIR NEWS

By R. W. Kellum

AIRPORTS now available in Indiana as listed by the Department of Commerce are: Ashley, Brazil, Cedar Lake, Ft. Benjamin Harrison (Schoen field), Ft. Wayne (Baer field), Ft. Wayne (commercial), Goshen, Indianapolis Airport (Co-Stout field), Kokomo (Shockley field), Lakeville, Laporte, McColl, Muncie (Wall field), Richmond (Berry field), Richmond Airport, Seymour, Shelbyville, Terre Haute, Terre Haute (Dresser field), Vincennes (commercial), Vincennes (municipal), Walcottville.

A NEW aviation organization in Indianapolis is being formed for general flying service. Carroll D. Doak is chief pilot. The company, backed by prominent business men, will have a flying course for students and will do taxi work on local or long distance flights. It has a hangar at the Indianapolis Airport.

EXPRESS service by plane has been started between Cincinnati, Indianapolis and Chicago by the Embry-Riddle Company, Cincinnati, which operates the mail line. The express is under the American Railway Express Company.

THE Aero Club of Evansville has had the local flying field airmarked in order that aviators may know where to land until the airport is placed in commission.

Officers of the Aero Club are: O. C. Carr, president; Austin Inglehart, 1st vice pres.; Geo. K. Krauss, 2nd vice pres.; S. M. Slaughter, 3rd vice pres.; O. L. Kessler, sec'y.; V. H. Goeke, treas.; Earl E. Harper, B. L. Kruckemeyer, Frederick P. Nehrbas, Floyd E. Stork, Flight Instructor and Director Aeronautics, J. Howard Wess, jr, and Paul H. Schmidt.

THE Atkinson Aviation Co. have secured the services of Lieut. Robert G. Minick, as chief instructor of flying for the Company.

Lieutenant Minick is a graduate of Kelly field, of the class with Col. Charles A. Lindbergh and Philip R. Love, and has had more than 2,000 hours of flying time.

Lieutenant Minick will have complete charge of the flying field and the equipment used as well as chief instructor of flying under the direction of L. H. Atkinson, operator of the school which now has an enrollment of 93 students.

INDIANAPOLIS NEWS

By Frank A. White

ARTICLES of incorporation have been filed here by a new air company which intends to establish an airport, engage in freight, passenger, express and mail hauling. The officers of the company are Elmer H. Jose, president; Ray E. Davis, vice-president; Edward M. Johnston, secretary; and Mrs. Helen Jose, treasurer.

Negotiations are under way to establish an airport north of Broad Ripple, a suburb of Indianapolis. The company will purchase new planes and equipment and start an air service between Indianapolis and Chicago.



A night class of students at the Atkinson School of Aviation, Gary, Indiana

AMERICAN LEGION posts throughout the United States are either at present engaged in marking the town names and landing fields or are planning to do so, Edward E. Spafford, National Commander of the American Legion reports. National headquarters of the Legion called upon its 11,000 posts to back aviation development in their cities and especially to undertake the marketing of air routes and fields.

Spafford has just made an air tour of 14 states, beginning at Pittsburgh, Pa., and carrying him as far west and north as Seattle, Wash., ending at Indianapolis. He was piloted by Capt. R. G. Breen.

KANSAS CITY NEWS

By H. H. James

MORE than 250 airplanes, manufactured or sold in Kansas City, have been delivered to individuals living within a radius of 300 miles of Kansas City in the last year. This was revealed by a checking of the records of local concerns. The planes have been delivered to business men, professional men and farmers in the territory. Most of them were purchased for non-commercial use by persons who have taken flying courses and bought planes for pleasure.

KANSAS CITY "air sightseers" are extending their trips to Kansas and Missouri towns, according to Frank Rowe, division agent of the Ni-Sun Lines, which recently started an airplane passenger service in connection with its bus lines.

The company gives free bus service from the downtown district to its flying field. The charges on long flights will be 35 cents a mile with one passenger; 17½ cents for two passengers; 16 2/3 cents for three passengers and 12½ cents when four passengers are carried.

E. E. PORTERFIELD, JR., president and general manager of the American Eagle Aircraft Corporation of Kansas City, announces that he has "stepped up" his production schedule for 1928 to 400 planes. The company made 32 deliveries in March and new dealer contracts have been closed in Decatur, Ga., Council Bluffs, Ia., Philadelphia, Salt Lake City, Norman, Okla., Newport, Tenn., Bluefields, W. Va., Roanoke, Va., Blair, Neb., Sturgis, S. D., and St. Louis. The company now has 125 employees with 75 orders for planes now on file.

Two new instructors—Lieut. George Boyd of Langdon, S. D., and Lieut. J. E. Foster—have been added to the staff of instructors at the Porterfield Flying Field. Lieut. Boyd will give ground and flight training and Lieut. Foster will lecture on engines, construction and repairs.

M. C. ANDERSON, owner of the Kansas City Flying School, located at the North Kansas City flying field, and Mrs. Anderson flew to Detroit for the All-American Aircraft Show.

Mr. Anderson has opened a new downtown office for his school and is organizing classes that will carry the students through to the final test examination for pilot licenses. The chief pilot at the school is Charles Gatschet.

A NIGHT school for persons wishing to become airplane pilots has been inaugurated here by the Bennett Flying School.

A course in ground mechanics as preliminary to the flying course is being given at 217 West 12th Street. Beginners may enter the school, which is open six nights a week, 7 to 10 o'clock, taking their ground work there and then when they are ready for flying, being transferred to the school's flying field at Richard Field.

THE new building catalog issued by the Butler Manufacturing Company of Kansas City and Minneapolis, has a number of interesting new items.

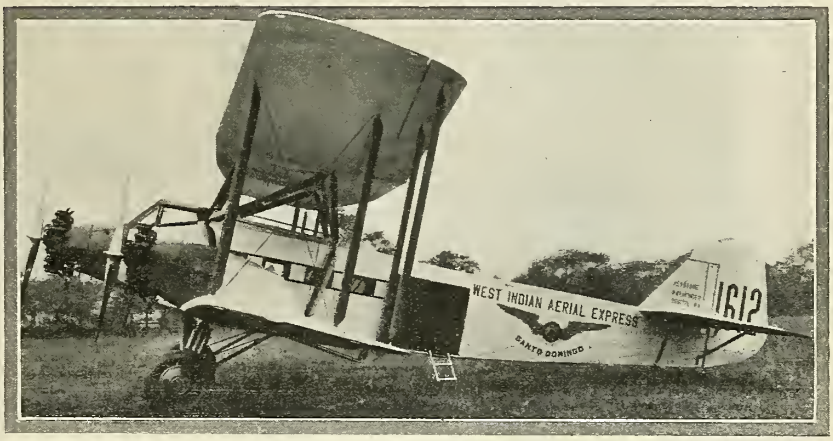
Drive-in Stations of different types are shown. Low priced and also more elaborate designs are featured and will appeal to filling station men. The combination steel warehouse and garage will attract the attention of station plant owners. Pictures show steel partitions for the application of plaster, for composition wall material, steel frame, steel roof and steel sash; how the application of brick is made; tests made on sheet steel to illustrate its strength; fire tests made by the Bureau of Standards and line drawings of buildings having wide spans.

A copy of this new catalog can be secured from the company.

THE Holcker Manufacturing Company of Kansas City, builders of coach bodies, now have an airplane department for the manufacture of parts. They are now available for special cowl work and aluminum gas and oil tanks.

"OH, BOY! WHAT PERFORMANCE!"

This enthusiastic comment, in a recent letter from the West Indies Aerial Express, refers to the Keystone Pathfinder, 3-Engine Transport — DeLuxe, 10-Passenger Air Liner (shown above) which links The Historic Islands of the Tropical Atlantic.



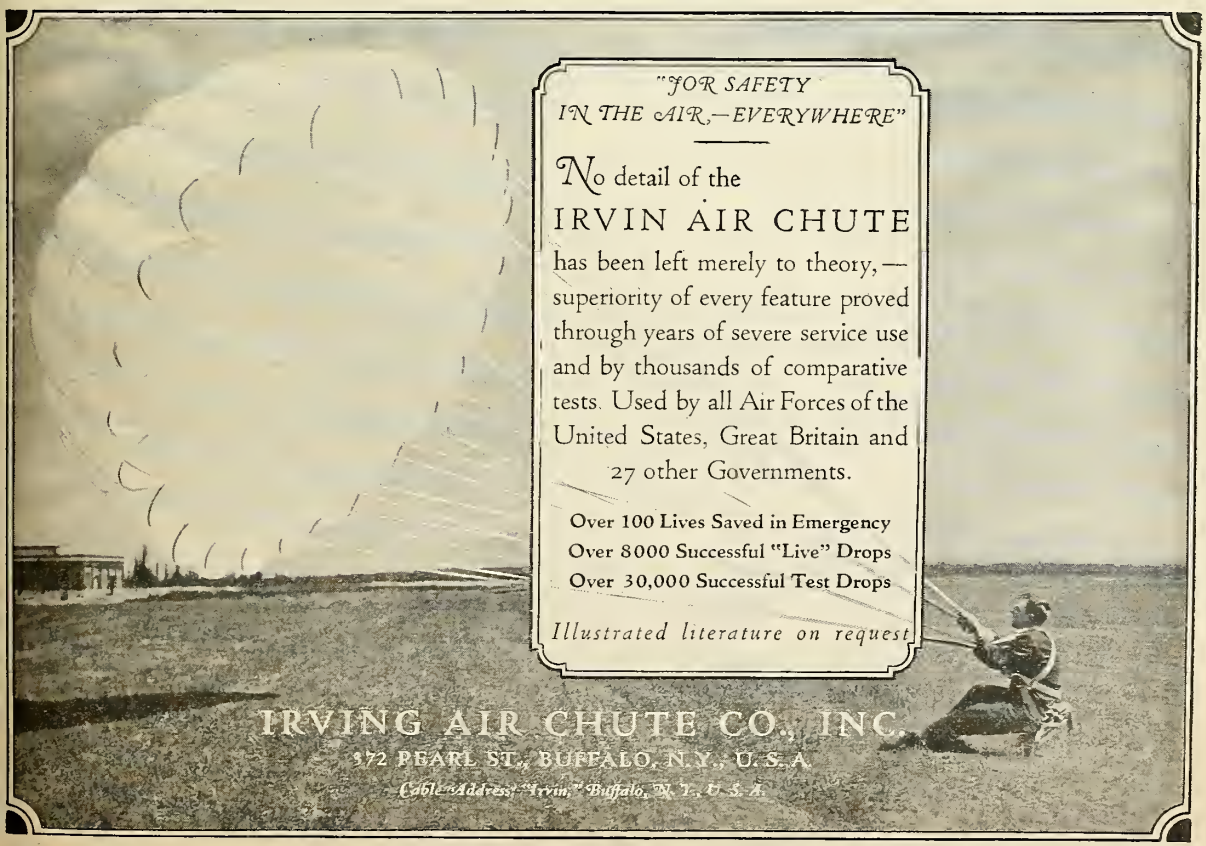
"393 hours without any major repairs" — "Never misses a trip" — such superlative performance by a large ship can only result from careful design, superior workmanship and the use of high grade materials.

Yet it typifies the service obtained by all users of Keystone planes.

The latest Pathfinder model, built around the air-cooled "Panther" bomber, is now under construction, and promises to become the sensation of the 12,000 pound class. It, too, is propelled by 3 radial, air-cooled engines.

Full particulars cheerfully furnished to interested operators on request.

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No detail of the
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has been left merely to theory,—superiority of every feature proved through years of severe service use and by thousands of comparative tests. Used by all Air Forces of the United States, Great Britain and 27 other Governments.

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SOUTH DAKOTA NEWS

By Harold Alexander

THOUSANDS of dollars are being spent on the leasing and acquisition of airports, construction of hangars, purchase of planes and equipment, promotion and development of airlines, establishing of aircraft agencies with the customary associated activities and several other efforts are being made to have South Dakota keep step with the progress of aviation.

DONALD SPEERS of Watertown was the first entry from his state in the model building and flying contest being sponsored by the *Minneapolis Journal* and he was followed by a number of other youthful aviation enthusiasts in South Dakota.

J. A. STRANSKY of Pukwana has organized a passenger line to include several of the leading cities in the state and will cover other nearby points.

MARKERS that are visible from a distance of twenty miles have been provided at the field at Mitchell. It is the intention to enforce government regulations at this field, which is about 2½ miles from the city, so as to assure a continued "safety first" program.

THERE is a Travel Air dealer at Frankfort. American Eagles are represented at Freeman and Volga, Wacos at Platte and Aberdeen, Eaglerocks at Rapid City and several other dealers and sub-dealers of more or less known ships are scattered throughout the various parts of the state.

THE Chamber of Commerce of Huron has leased a 100-acre tract, which is located only about a half mile from the city limits on a trunk highway. Two runways, in north-south and east-west directions, will be laid out with each one being about 600 feet wide and 3,000 feet long. Equipment for day flying only will be available at present.

THE props manufactured at Aberdeen by Ole Fahlin of the Dakota Airplane Co. are increasing in favor with the pilots. The experimental stage has been passed and an increasing rate of production is necessary to meet the ready demand. Fahlin was a former member of the Swedish Air Service and was also employed in the manufacture of Hamilton propellers.

AT Redfield, Hubert Rueschenberg and Ralph Hopkins have the Travel Air dealership under the Roth-Downs Airways, Inc., of St. Paul. As both of these fliers have been operating for several years they expect a good business in passenger carrying and student instruction.

DAKOTA Airlines of Sioux Falls claims the distinction of graduating South Dakota's first aviatrix, Miss Nelle Zabel Willhite of Pierre, under the tutorship of Harold W. Tennant. Miss Willhite took her first solo flight after 13 hours in the air.

OKLAHOMA AIR NEWS

By Ernest W. Fair

THE Oklahoma Air Tour, which is to take in many state cities, plans to start May 14th. The tour, being backed by the Oklahoma State Chamber of Commerce, is to promote aviation interest in Oklahoma. A large number of planes are expected to be in the tour, among them the Spartan, an Oklahoma manufactured plane. The pathfinder ship, a Spartan, has already flown part of the route and returned to Oklahoma City, the starting point. Charles Parker was the pilot on this trip.

THE Petroleum Airline has been incorporated and soon will be in operation from Bartlesville and Tulsa to San Angelo, Texas. Mail, passengers and express will be carried. It is backed by oil men and the chambers of commerce of cities along the route. Judge W. N. Bonner and Hubert M. Harrison of Wichita Falls and Earle P. Halliburton of Duncan, Okla., formed the committee on incorporation. The directors and incorporators for Oklahoma Cities are: Oklahoma City—Virgil Brown and H. C. Martin; Tulsa—Waite Phillips and J. A. Kennedy; Bristow—C. L. Freeland and Dr. W. W. Groom; Duncan—Halliburton and another. The cities on the proposed route are: Bartlesville, Tulsa, Bristow, Oklahoma City, Wichita Falls, Abilene and San Angelo.

THE Oklahoma Air Transport Co. has reorganized and taken over the agency for the American Eagle ship besides opening a school and a commercial port. Jimmie Haizlip is chief pilot and Roy O. Hunt is member of the firm and pilot.

CLINTON has the Coffman-Strong Aircraft Co. as its chief asset. They have already made their first monoplane and expect to go into production soon.

FREDERICK is one of the latest towns of Oklahoma to become air-minded. Citizens of that city are now pushing forward plans for establishing an airport.

The Everett Taylor field at Ponca City has been dedicated as the municipal port. Ponca City is now on the terminus of the Tulsa line, which is a feeder to the air mail which flies through Ponca.

Hobart has completed plans for a landing field.

A field is being planned at Fort Reno to be used jointly by the Army post stationed there and the town of El Reno.

The American Legion at Duncan has done much to put over the bond issue that made the field in that city possible.

The new field at Enid has been dedicated and is being used by commercial ships.

The Tulsa bonds for improvements of the municipal airport passed by a huge majority. This will enable Tulsa to have one of the very best fields in the entire state.

WISCONSIN AIR NEWS

By Roy Leavitt

SUPERIOR, WIS., and Duluth, Minn., both hundreds of miles north of either Milwaukee or Minneapolis, want air passenger, freight and express service. Several propositions are now being considered. One of them by the Northwest company of Minneapolis and the other by the North American company of Appleton.

WITH a first rate airport on their hands, but practically abandoned, the city of Madison is wondering what to do with Pennco field. Several companies have started up in business but for one reason or another have failed to make a go of it although there has been a fairly big demand for air service at all times.

AMONG Wisconsin cities to quit their petty fighting and jealousies and get down to business is La Crosse. This city, on the mail line between Milwaukee and Minneapolis-St. Paul, was threatened with the loss of their service unless adequate facilities were furnished. After several rows among the city fathers, prominent business men took a hand in the matter and got action.

SHEBOYGAN is one of the large Wisconsin cities to buy an airport during the past month. Their new field is less than a hundred acres in size but is ideally situated. The move to buy the new field was started when the North American Airways company, Appleton, announced they would stop their planes there en route from Menominee, Mich., to Chicago if suitable facilities were provided.

MENOMINEE, MICH., across the river from Marinette, Wis., has bought a large air field on the lake front and has secured 100 acres adjoining if needed. The city fathers have guaranteed the North American Airways company $15,000 in business this summer.

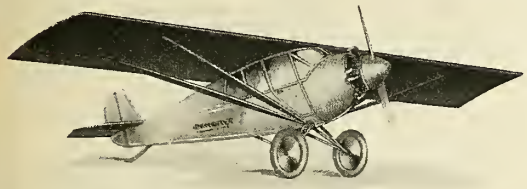
Manitowoc, another stop on the Menominee-Chicago run, is remodeling its airport putting some wire underground, cutting down trees and taking on an adjoining field.

THE Hamilton Metalplane company of Milwaukee, has appointed C. F. Van Sicklen as sales manager of the company. Mr. Van Sicklen recently resigned as sales and advertising manager of the Advance Aircraft Company of Troy, Ohio.

THE Mid West Air Transport Co. of Madison, state distributors of Travel Air planes, have appointed the Oshkosh Airport, Oshkosh, as dealers of Northern Wisconsin.

BELOIT Airways of Beloit is opening a new field, sponsored by the Business Men's club and the American Legion, and has been given Rock and Walworth counties for their territory on Travel Airs.

The
AIRMASTER COUPE



The Personal Airplane

Every forethought has been taken by *Airmaster Coupe* designers for the safety, convenience and flying comfort of the *Airmaster's* passengers and pilot.

The *Youngstown Youngster*, the "Little Airmaster," has the same elegant appearance, the same easy control in the air.

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Three-Place Cabin
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$3,000 Flyaway
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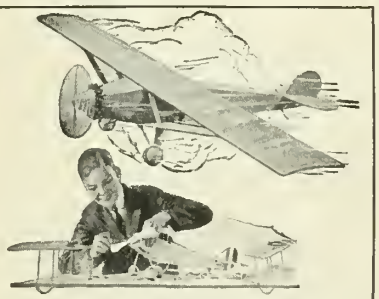
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ALL-KANSAS AIR TOUR

By Edwin W. Pryor

THE All-Kansas Air Tour drove home to more than 150,000 persons the fact that aviation is here commercially. That is a conservative estimate of the crowds that viewed the caravan of 16 airplanes, ranging in size from the Ford-Stout tri-motored all-metal plane owned by the Standard Oil Company of Indiana to the P1 pursuit ship flown by Lieut. Ennis C. Whitehead, that toured the state of Kansas April 2-7, inclusive, visiting 23 cities during the six days.

Governor Ben S. Paulen was a passenger aboard the *Stanolind,* the Ford-Stout plane that acted as flagship for the tour. He spoke at every stop, urging the citizens of this state to establish adequate landing fields, talking in glowing terms of the future of aviation, and stressing the safety of aircraft to-day.

Others who made addresses were: Carl F. Schory, secretary of the N.A.A. contest committee; Allen Jackson, vice president of the Standard Oil Company of Indiana; C. F. Hatmaker, assistant general manager of the western division of the same company; C. F. Gates, president of the Prairie Pipe Line Company; Marcellus M. Murdock, president of the Wichita N.A.A. chapter; Lieut. Ennis C. Whitehead; Roscoe Vaughan, treasurer of the Wichita chapter and one of the originators of the tour; and Arch Merriam, state N.A.A. governor and flight commander.

Included in the list of ships starting on the tour were the *Stanolind,* a new Travel Air monoplane, Travel Air biplanes, Swallow biplanes, a Cessna cantilever wing monoplane, two Waco planes, an Army P1, a Buhl plane piloted by E. W. Day and Richard Lees, jr., Department of Commerce aeronautical inspectors, and the Stearman biplane which flew with Lieutenant Whitehead's pursuit ship as pathfinders for the caravan, and to clear the fields at the different stops.

The cities visited during the week were: Newton, Hutchinson, McPherson, Salina, Concordia, Abilene, Junction City, Fort Riley, Manhattan, Topeka, Kansas City, Kansas, Ottawa, Garnett, Iola, Chanute, Parsons, Coffeyville, Independence, Moline, Arkansas City, Winfield, and Eureka, in the order named.

NEBRASKA AIR NEWS

A MODERN aviation school was opened recently at Norfolk by A. A. Risser, who obtained a long time lease on an ideally located field just one mile from city limits southeast of town along the Norfolk, Fremont highway. The airport, on which has been constructed a two-plane metal hangar, is surrounded by open country.

Mr. Risser sells and uses for all instruction work the Lincoln Page plane.

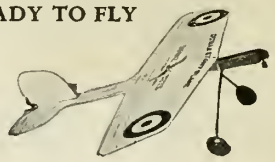
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RADIO EQUIPMENT FOR U. S. AIRWAYS

CONTRACTS have been awarded covering radio equipment for twelve radio control stations, six radio beacons and twelve marker beacons to be established on the National Airways in the amount of $155,277. The award for radio transmitters for control stations and radio beacons was made to the General Electric Company, and the radio transmitters for the marker beacons were awarded to the Westinghouse Electric and Manufacturing Company. The radio control stations collect weather information telephoned from intermediate fields along the airways and exchange weather information with other terminal landing fields for use of the airplane pilot before starting his flight. After the departure of the plane and while in flight, the control station will keep the pilot advised of any change in weather conditions or landing condition at the terminal fields along the airway. The radio and marker beacon will provide radio direction for navigating the airplane. The radio equipment contracted for will be delivered to the Department within six months, and the control and radio stations will be established this fall on the National Airways where night flying is required. The installation and maintenance will be under the direction of the Airways Division of the Lighthouse Service.

NOTRUS HANGAR CORP.

NOTRUS HANGAR CORPORATION has been organized at Houston, Texas for the manufacture of hangars to accommodate any type or size of aircraft.

Their "Turtlebak" hangar, so named because of its resemblance to a turtle's back, is designed to accommodate an individual plane. These hangars are made of assembled sections joined together by carriage bolts of sufficient strength to anchor bolts imbedded in concrete. All of the company's hangars are built in sections and are made in the factory. They can be assembled on the desired location within 48 hours.

Harry E. Weaver is president of the organization; W. H. Rankin, secretary and treasurer; Theodore Ahlborn, vice president; Otis S. Van De Mark, chairman of the board; Daniel Loob, director of sales and advertising. Among the more prominent stockholders are W. T. Carter, Wm. Cochran, James Shively and Otis Van de Mark.

NAT'L BALLOON RACE

THE National Elimination Balloon Race for the second Litchfield trophy will be held May 30 starting at Bettis Field, Pittsburgh. The winners of the first three places will comprise the American team to be entered in the Gordon Bennett International Balloon Race which will start from Detroit, June 30.

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FOREIGN AERONAUTICAL NEWS IN BRIEF

Compiled from the foreign aeronautical press, the Transportation Division, Bureau of Foreign and Domestic Commerce and our special correspondents

CANADA

Canada Air News

By James Montagnes

CANADA'S air mail is to start functioning early this summer, four contract routes having been arranged. Taking the mail from incoming trans-Atlantic liners, one service is to operate from Father Point to Montreal four times a week at a cost of $49,000 or $1.25 per flying mile. The Canadian Transcontinental Airways, Ltd., of Quebec, has been awarded this contract.

Canadian Airways, Ltd., of Montreal has been awarded the contract for a service from Montreal to Toronto, four times a week at $49,000 or $1.25 per flying mile. This service is expected to start on May 1st, the Leaside Airdrome of the Toronto Flying Club to be used.

A third service from Montreal to Ottawa, bi-weekly for the season will be performed by the Canadian Trans-Continental Airways, Ltd., for $8,250.

The fourth service, awarded to the Canadian Colonial Airways Company, calls for an all year service, between Montreal and Albany, N. Y., to connect there with the United States transcontinental service. The cost of this service is $95,900.

The total cost of this nucleus of Canada's air mail service is $201,150. It is hoped that in time the mail will fly from Halifax to Vancouver in 36 hours, instead of the present five days by train.

News from Canada

By C. P. C. Downman

THE J. Dalzell McKee "Trans-Canada trophy" an annual award for meritorious service in the advancement of aviation in Canada has been awarded for the year to Captain H. A. "Doc" Oaks.

During 1927 Captain Oaks was manager of the Western Canada Airways, with headquarters in Winnipeg, and under his direction great strides have been made in organization of efficient flying services in Northern Ontario, Manitoba and Saskatchewan.

Captain Oaks is a mining engineer and geologist by profession. He served in France and England in 1917 and 1918 and was wounded with the 48th Squadron, Royal Air Force, in France.

GENERAL AIRWAYS has been incorporated and will operate a passenger service in Quebec and Ontario. Headed by N. Cumming, others identified with the company are: A. R. Brown, Toronto airman, and G. M. Bawley, who has been named as vice president.

THE Canadian Wright Limited, recently organized for the purpose of supplying Canadian aircraft with the famous Wright Whirlwind engine, has just completed the assembly and testing of the first engines at its plant in Maisonneuve, Montreal. These engines are of the latest J5CA type and have been shipped to the Patricia Airways, Ltd., and Canadian Western Airways of Winnipeg.

WITH the opening of navigation on the St. Lawrence, the air mail service from Rimouski has been resumed. Last year the service was confined to Montreal, although one trip was made to Ottawa. This year, however, there will be an extension and both Ottawa and Toronto are included in the air mail program.

With the opening of the St. Lawrence navigation the winter air mail service to Anticosti and the Magdalen Islands has been discontinued.

A CLUBHOUSE for members of the Montreal Light Aeroplane Club will be erected at St. Hubert, five miles outside Montreal, where the Government is creating an airdrome of 750 acres, and where the airship mooring mast will be established.

Captain F. G. M. Sparks, instructor at the London, England, Light Aeroplane Club, will be chief instructor for the Montreal Light Aeroplane Club.

THE Royal Canadian Air Force is cooperating with the Department of Agriculture, through the Dominion plant pathological laboratory at the Manitoba Agricultural College, Winnipeg, in the great work being done in studying and formulating a plan of control for one of Canada's worst and most costly enemies—wheat rust. Canadian "Moth" planes are used. Airplanes have been used extensively for the purpose of locating diseased conditions in forests, and also in dusting from the air for the control of the spruce budworm and in other investigations.



Display of Italian military planes at Centocelle, Italy.

ITALY

IN a speech delivered March 23rd at the Italian Parliament by General Balbo, Undersecretary of State for Aeronautics, the Minister summed up the excellent results of the aeronautical activity in Italy during 1927. Among other subjects, he dealt with the actual activity of the Italian Air Force in the last few years. During 1924 the pilots of the Air Fleet totalled no less than 60,103 flying hours, during 1926 the figures went up to 70,136; during 1927, 8,821 hours were flown, which are distributed as follows: land machines, 34,268 hours; seaplanes, 11,797; airships, 4,201; pupils of the Central Flying School (Aeronautical Academy), 15,469; aircraft of the Experimental Group, 1,136; other flying schools, 30,000 flying hours.

The following is evidence of the flying activity of the highest chiefs of aeronautical Italy: General Balbo, more than 270 hours during 1927; General De Pinedo, 450 (inclusive of his recent famous flight); General Capuzzo, 61.45"; General Lombard, 37.15"; General Vece, 45.30"; General Valle, 37.20". The Colonial Aviation is largely represented in the above figures. The Cyrenaica Air Force totalled about 500 hours flown; the Tripoli A.F., 1,800; the Somalia A.F., 365. Most of these flights were carried out in war service.

Automatic restoration of aircraft to normal position during flight, the minimizing of risks resulting from "stalling" are fundamental problems being dealt with by Italian technical men. The Italian Government have contracted with the Handley Page Firm and is testing the slot wing on the Br 1 machine.

To prevent fire dangers all Italian aircraft have to have on board an improved extinguisher and every airman in flight must wear a parachute.

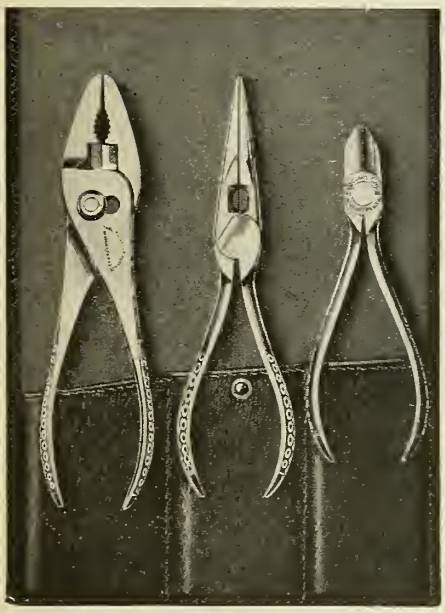
During 1924, the Italian Air Force recorded a mortal accident for every 1001 hours flown; in 1925, 55 accidents (1 for 1071 hours flown); in 1926, 71 accidents (1 for 987 hours flown); in 1927, 96 accidents (1 for 1051 f.h.).

THE Italian expedition to the arctic regions, consisting of nineteen passengers and crew, made its start from Milan on April 15. The expedition is under the able command of General Umberto Nobile and with Colonel Grossa, as his competent aide. They

(*Continued on next page*)

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This quaint little scene, frankly, is just about what some folks think of a correspondence course in Flying. *And I don't blame them.* Now what do you think of that?—coming from the president of a home-study Aviation school? . . . If you think it's odd, then you haven't a clear idea of what *Aviation Institute* is doing. And I sincerely do want you to know.

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(Foreign News continued)

anticipate making several trips of long duration from their Spitzbergen base; one of these will be to the North Pole, others to the northeast and northwest. The airship to be used, the *Italia*, is a development of the *Norge* which was used by Captain Amundsen in his 1926 polar expedition. The *Italia* will be in constant radio communication with Rome.

FRANCE

CAPT. GIRARDOT and Lieut. Cornillon have completed a remarkable long-distance flight by flying from Paris to Timbuctoo and back in 4½ days. They left Le Bourget in an Amiot S.E.C.M. 122 (650 h.p. Lorraine), accompanied by a navigator and a mechanic, early in the morning on April 3 and arrived at Colomb-Bechar (Algeria) that evening. After refuelling they set out again, and flying by night over the Sahara, reached Timbuctoo at 6 a. m. the following morning. They started again after a hasty meal, and flying via Banako, Dakar, and Casablanca, arrived at Villacoublay on April 7, having covered in all 6,200 miles in 65½ flying hours, at an average speed of 95 m.p.h.

THE note-worthy round the world tour of Captain Dieudonne Costes and his navigator Lieutenant Commander Joseph LeBrix was successfully completed on April 14 at Le Bourget. Early in October these gallant Frenchmen in the *Nungesser-Coli* started on the first lap of what has proved to be one of the greatest world flights. They completed 35,000 miles in 338 hours of flying time in one Breguet XIX plane, powered with an Hispano-Suiza, 500 h.p. engine.

The variety of countries visited added keen interest to the tour. The route followed included stops at St. Louis, Africa, Natal, Caravellas, Rio de Janeiro, Pelotas, Buenos Aires, Montevideo, Santiago, La Paz, Lima, Guayaquil, Panama City, Colon, Caracas, Baranquilla, Guatemala City, Mexico City, New Orleans, Montgomery, Washington, New York, Sharon, Detroit, Chicago, Rock Springs, San Francisco, Tokio, Hanoi, Calcutta, Karachi, Basra, Aleppo, Athens, Paris.

On their return to Le Bourget the aviators were received with the same keen enthusiasm that had been displayed in every capital in which they stopped. Their rôle as ambassadors from France was diplomatically played.

ENGLAND

THE Britannia Trophy has been awarded by the Royal Aero Club to Lieut. H. H. Bentley, A.F.C., S.A.A.F., for his solo flight from London to Cape Town in a D. H. Moth (A.D.C. Cirrus engine) between Sept. 1-28, 1927.

The Britannia Trophy was presented to the Royal Aero Club by Mr. Horatio Barber, to be awarded each year to the British aviator who, in the opinion of the Committee, shall have accomplished the most meritorious performance in the air during the year.

CZECHOSLOVAKIA

COMMERCIAL air transportation in Czechoslovakia made considerable progress during the year 1927. Owing to the central geographical position of the country on the intersection of the European traffic between the west and east and the north and south of Europe, the activities on the airports of Prague are worth studying. The organization of commercial air transportation in Czechoslovakia is in the hands of the Ministry of Public Works, while the Ministry of Posts and Telegraphs is in charge of the transportation of mail.

There are several lines operating on the territory of the Republic of which the Czechoslovak National Airlines are a State institution, while two other lines, the International Company of Aerial Navigation, and the Czechoslovak Air Transport Corporation are supported financially by the State. The latter corporation coöperates with the German Lufthansa A.G. in Berlin and the Austrian Luftverkehrs-Aktien Gesellschaft in Vienna. The Polish line Aerolot, connecting Warsaw with Vienna, also runs across Czechslovakia and the airfield of Brno (Bruenn) brings it into the system of the Czechoslovak airlines.

Czechoslovakia, being a highly industrialized country without a seaboard, the importance of the air transportation was quickly grasped by the Czech authorities and liberal financial support from the state treasury has been given to aeronautics. Although not yet self-supporting the airlines are already approaching this goal.

Czechoslovak National Airlines regularly cover the following routes: Prague-Brno-Bratislava - Kosice; Prague - Marienbath-Carlsbad. The International Company for Aerial Navigation maintains communication between: Prague - Nurnberg - Strassbourg-Paris; Prague-Warsaw; and Prague-Vienna-Budapest-Belgrade-Bucarest-Angora. By means of the German Lufthansa A.G. the airport of Prague is the starting point for flights to Dresden-Berlin-Luebeck-Kopenhagen-Malmoe; Chemnitz-Halle-Hannover-Bremen; Breslau-Prague-Munich-(Zurich-Lausanne-Geneve-Marseille). The sector Prague-Vienna is worked by the Czechoslovak and Austrian planes in accordance with the agreement concluded with the Austrian Luftverkehr Gesellschaft in Vienna. Brno, the capital of Moravia, provides a landing place for flights between Berlin-Breslau-Brno-Vienna and Krakow-Brno-Vienna. A direct airline connecting Prague with Venice (Italy) via Vienna will be inaugurated in spring.

Traffic on the Czechoslovak National Airlines is carried on from March 1st to October 31st. Next year a winter schedule will be introduced. In spite of rather unfavorable conditions during the winter months, particularly on the sector of Slovakia, the schedule was maintained with 96 per cent regularity.

The National Air Lines use 7 airplanes of De Havilland, type DH50, several biplanes of Czechoslovak production, type "Smolik 19," and 2 airplanes of Farman-Goliath type accommodating 12 passengers and 2 pilots. The latter machines were manufactured in Czechoslovakia by the "Avia", the most important of the Czechoslovak airplane plants, who have the French patent.

The International Company for Aerial Navigation begins its activities on February 15, continuing them till November 15. 80 one-motor machines of the type "Spad 56" are used besides 3-motor planes of Caudron-81 type and Farman-Jabiru type.

On the line Berlin-Vienna the German Lufthansa uses Junkers G-27 3-motor planes, accommodating 8-9 passengers. Junkers F-13 and Dornier-Merkur one-motor types also are used.

The number of flights made on the Czechoslovak National Airlines during the present year was 2,268 or more than double those in 1926 when the number was 1,082. The distance covered was 415,278 kilometres, compared with 250,000 last year. In 1924, the number of passengers conveyed was 426, in 1925 this increased to 604, in 1926 to 1,703 and in 1927 to 4,233. In 1926 the amount of freight carried was 4.5 million kilograms, a figure which increased in the current year to 18,1 millions. From 1924 to 1927 inclusive, no accident involving injury to passengers has happened. In 1927 a single emergency landing only occurred. This high degree of safety and regularity applies to all the Czech lines.



An Avia type BH single-seater on display in Czechoslovakia.

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Picked from the Air



AERO DIGEST will award a prize of $5 each month for the best humorous contribution published. Only those pertaining to the aircraft field will be considered. Address the "Picked from the Air" Department, Aero Digest, 220 West 42nd Street, New York, N. Y.

Russell Gard, Philadelphia, Pennsylvania, won the prize for May.

First Mechanic—"Say, Bill, take a look at this fine picture I have here of Colonel Lindbergh."

Second Mechanic (After looking for a moment or two at the picture)—"Why, this ain't no picture of Lindbergh. It's just a blank piece of paper."

First Mechanic (Examining the "picture" again)—"Doggone it, he must have hopped off again."

Hunting a Thrill

Flies from Georgia to See
Friend Injured in Crash—
—Boston Herald.

Stringing It Out

Chamberlin completed work on the plane, in which he is to make a 30,000-mile lecture. *—Peoria paper.*

Little more aviation and we'll have to start zoning the ozone.—*Arkansas Gazette.*

Maybe a visit from Lindy would help the Houston convention.—*Tampa Tribune.*

WANTED—To drive truck or taxi car, reasonable price. Can't stand hard work since fall in airplane. Joseph Kane, R. 1, City.—*Martinsburg, W. Va., Journal.*

Uncle Sam has earned the credit of introducing two kinds of diplomacy: shirt-sleeve and airplane.—*Boston Herald.*

A Spanish toreador says Colonel Lindbergh would be a great bull-fighter. Considering his marvelous resistance to bull, he already is.—*Arkansas Gazette.*

Frustrated Life

Lady—"How come you are a tramp?"

Tramp—"Crowded out of my profession. I'm a sky writer from Pittsburgh."

Allston (Mass.) Recorder.

Oh! See the Dicky Bird

Two experiments in this line are noted by the papers, one conducted by a man in Brooklyn, his machine having four wings like a bird.

Editorial in the Indianapolis Star.

That fool-proof airplane that has been invented in England is a little late. We had our picture taken in one at Coney Island last summer.

* * *

A San Diego school has a class in parachute jumping. Students who fail to pass the final examination probably don't bother about going back.—*Russel Crouse in the N. Y. Even. Post.*

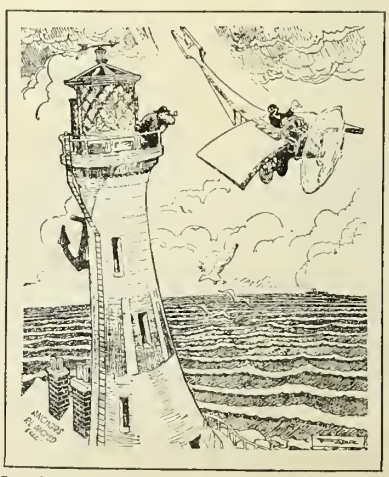
"Houses Shaken in Queens."—*Headline.* Probably Mr. Levine making a landing.

* * *

"Los Angeles at Panama Canal.'—*Headline.* If Little Willie gets a poor mark in geography this month you'll have to excuse it.—H. I. Phillips in the N. Y. *Sun.*

Instructor (to new student aviator): "The motor is 'missing.' We will have to go down."

Student (looking up over windshield): "No, it isn't; it's right where it was when we started." *—Urban Lowden.*



In the year 2000—"Good mornin', Skipper! I'm just down out of a fog. What's your ocean—the Atlantic or the Pacific?"
Judge.

Of Trumps

The Girl—"I should think you'd feel happy as a king when you're in the air."

Aviator—"Happier. I'm an ace."—*Boston Transcript.*

The navy has tabooed the loop-the-loop for the flyers, probably because it upsets them so.

* * *

Under the new law in New York, driving an airplane while drunk, hitherto punishable by death, is now only a misdemeanor.
—The Detroiter.

On a farm in North Georgia is posted this sign—

"Flivvers ottymobile and flyin' machin' picknickers will be persecuted to the full extent of low mean mongrel dogs which ain't never been overily soshibil with strangers and one dubbel barel shotgun which ain't loaded with no sofy pillers. Dam if I ain't tired of this hell raisin on my property."
—Fairchild Aerogram.

The Breman was late. The reason was—they were hungry and the Baron opened the lunch basket and pulled forth the frankfurters and sausages; they were about to eat when Col. Fitzmaurice said, "Say, this is Friday we can't eat meat." Consequently they stopped to fish.

—C. Raymond Kramer.

Maybe the Irish pilot of the Breman just couldn't resist stopping at Greenly.
—"The Fun Factory."

Two Irishmen in a large aircraft factory were discussing the probability of Life, after Death.

"Moike, shure I belaive there is a loife after leaving this worrld, and it twi'll be a case of every man for hisself, or in other worrds, to his trade. Now, for example, a musical instrument moiker t'would build the harps or trumpets for the Angels to play their daily chords. Me,—I'm a wing builder. What a joy it will be to moike wings for the Saints! I can almost hear good old Saint Patrick, with a broad grin on his faice, pat me on the back and say, "Pat McCarthy your a wonder, moike me anither pair."

But I pity you Moike, my heart is already filled with sorrow, all you can do is moike tails. *—W. J. Powers.*

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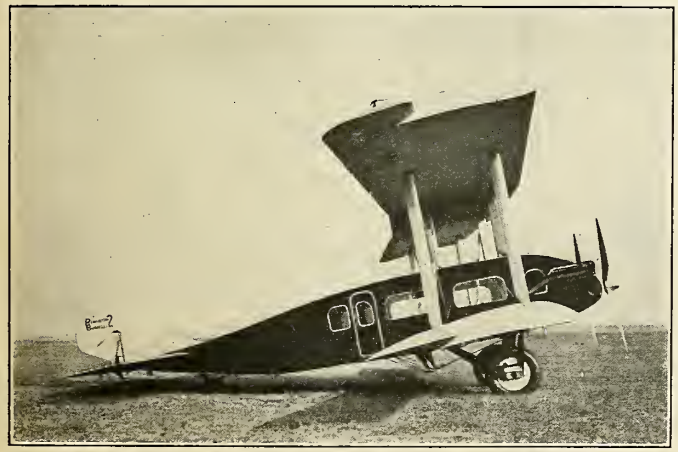
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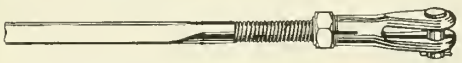
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MACWHYTE

Streamline and Round Tie Rods

Patent Safe Lock Terminals

THE WILKINS ARCTIC EXPEDITION

(Continued from page 741)

miles in flights between Fairbanks and Barrow, the Arctic shore base of exploration. Alger Graham, of Detroit, relief pilot of the 1927 expedition, made approximately 5,000 miles in similar flights and in the Arctic shore area. Eielson, pioneer of Alaskan pilots and the most experienced of all Arctic aviators who have tried their wings in those regions, covered approximately 10,000 miles on the three expeditions. Joe Crosson, who has flown all over Alaska in the past five years, made two flights for the expedition of 1927, totalling 1,400 miles.

On all of these flights, except trips by Lanphier, Crosson, and some of Graham's shore flights, Captain Wilkins was navigator with Eielson or Graham, and has to his credit a total of approximately 13,000 miles of Arctic flying.

Four different types of planes were used—Fokker, Stinson biplane, Swallow and Lockheed. Two Fokkers, one with Liberty Engine, and one tri-motored with Wright Whirlwinds, were used. Two Stinsons, with Wright Whirlwinds; the Swallow with a Hispano-Suiza motor; and the Lockheed, with Wright Whirlwind.

Landing gears were used in tests and on flights were wheels, landing on dirt, snow and ice; skis, both wood and Severski metal, the latter landing on ground in the last flight of the 1927 expedition from Barrow to Fairbanks; and a combination of skis and wheels was tried out in tests.

The Fokker plane made a total of six round trips over the Endicott Mountains in 1926, from Fairbanks to Barrow, rising, as all planes on this route must, to 9,000 elevation to clear the lowest point, Anaktuvak Pass, and carrying loads up to 6,000 pounds, chiefly gasoline.

The Stinsons were loaded up to 2300 pounds. The Lockheed, in Wilkins' and Eielson's flight from Barrow to Spitzbergen, took off with a load of more than 3,000 pounds, the bulk of this consisting of 370 gallons of gasoline and 12 gallons of oil.

Temperatures ranging from 33 above to 48 below zero, were encountered in the various flights of the expedition, the lowest, 48 when Wilkins and Eielson neared Spitzbergen on their last flight. Except for the inconvenience and delay of warming motors by covering them with tents, with oil stoves underneath, before starting in low temperatures, the cold of the Arctic did not appear at any time to prevent the proper functioning of motors.

The only forced landings, during the three expeditions, were those of March 29, 1927, when Wilkins and Eielson, 500 miles northwest of Barrow, were compelled to come down because a leaky oil pipe fouled one of the magnetos of their Stinson; and their landing that night, after nine o'clock, because of failure of gasoline, after they had fought their way to 100 miles of the coast against a southwest blizzard with wind at 70 miles per hour. Coming down in pitch darkness, unable to see out of the windows of the cabin, they crashed on the ice, breaking the skis, but with no other mishap. They were held in the plane cabin for five days by the blizzard, then took 13 days to walk 80 miles to shore, arriving at Beachy Point, 92 miles down the east shore from Barrow. During their wait of five days in the plane they had drifted 167 miles southeastward.

On that one flight they succeeded in taking a sounding of more than three miles, 500 miles northwest of Barrow, proving the continental shelf in that direction, and the impossibility of land in that area of the Arctic.

The expedition of 1926 was sponsored by the Detroit Aviation Society and the American Geographic Society, and by the people of Detroit. It failed in Arctic explora-

tory flights because the Endicott mountains proved impassable to dog teams trying to get gasoline through to Barrow.

The expedition of 1927 was sponsored by the Detroit News, the North American Newspaper Alliance, and the American Geographic Society; the Detroit News bearing most of the expense of the expedition.

At the termination of that expedition, the Detroit News gave to Captain Wilkins the remaining Stinson plane. The Fokker had been left in Fairbanks, during the 1927 expedition, because the propeller would not lift a useful load over the Endicott mountains. This plane, and the fuselage of the other Fokker, whose wing had been crashed the year before, were the property of Captain Wilkins. He sold the Stinson and the Fokker equipment, and put the proceeds into the Lockheed plane of his 1928 expedition.

Wilkins and Eielson were the total personnel of this expedition. They left Fairbanks in the Lockheed Ma 20; flew over the Endicott range to Barrow, and on April 15th made their memorable flight to Spitzbergen, landing on a small island in the north of the archipelago, where they were storm bound for five days, finally getting away again and landing safely at Green Harbor, where, as the story is written, they are waiting for the Arctic ice to break up sufficiently to allow a boat from Norway to bring them out.

The severity of the weather; the storm area into which they ran on the Spitzbergen side; the impossibility of safe landing on the ice en route; and, more than all else, the rapid and great changes of magnetic fields in the area northeast of Barrow on their route, makes the flight to Spitzbergen epochal in history of aviation.

They crossed the area of the northern hemisphere most difficult of aerial navigation, in a flight of 2,200 miles terminating in the worst storm Spitzbergen has seen in years in the month of April, and reached their target in a non-stop flight—a remarkable feat of navigation.

The fact that no land was discovered on this flight is a negative scientific result, but of great value to oceanography and to meteorological developments of the future. Captain Wilkins reports that over a distance of 120 miles, an area between Greenland and the Pole was blanketed with fog, making it impossible to determine whether there might be land there. Except for this spot, their route, for nearly 100 miles on either side, was free from land, though this fog, like a drawn curtain, may have shut off extensive land to the north.

Will they go again? If they do the whole world will wish them God-speed, for the world today acknowledges the courage, skill and steadfastness of purpose of Wilkins and Eielson.

LETTERS TO UNCLE FRANK

(*Continued from page 751*)

They call this a private hospital, but right now I feel about as private as a goldfish.

I'm writing this with my trusty and rusty typewriter across my tummy, which isn't important except that it shows you that whatever was operated on it wasn't my tummy. And except that I feel a little like a patchwork quilt liberally decorated with brier-stitching I'm in pretty good shape, except at the actual scene of operations as we say in the Army. And you can tell the world from me that I made it on a couple of egg and lettuce sandwiches and a bottle of gin, and smoked nothing but that kind of cigarettes which you have to smoke blindfolded, and if you can get anything out of these few brief testimonials, you might let me know.

(*Continued on next page*)

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and passengers.

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WRITE FOR PARTICULARS

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(Continued from preceding page)

It just dawns on me that I'm missing the All-American Aircraft Show at Detroit, which is adding insult to injury when you figure how much I'm missing already, now that these doctors have got through with me and taken a few souvenirs off my fuselage. I'm real sorry not to be there; like to go to shows and walk around and collect literature d drive salesmen and demonstrators mildly insane. I al-ays go to the Auto Show and look at all the pretty agons and pick out a purely hypothetical stable of sport dsters and town-cars, with a baby-blue limousine for the e and a snappy half-ton truck for the use of the hired n if we had a hired man. After which I drive home in eet Genevieve, who is without doubt the worst looking position of frayed tomato cans that ever escaped the of the junk man, and thereupon forgot about auto s for another year.

uppose a good time is being had by all, and I should ly like to be there. Maybe I could pick up some amples—airplanes and blimps and parachutes and for the little Sub Rosas to play with. I might even some of the pilot personalities that Uncle Cy Caldwell ws so well. I'm not sure if they know him, but he cer-ly does seem to know everybody in the air business who worth the trouble. Anybody that Uncle Cy doesn't know as a perfect right to feel hurt, and might as well crawl into an airpocket and button it up. That's what it is to be a personairlity, as we Scotchmen say.

Ignoring this operation, which is easier said than done, the reason I didn't go to the Air Show is that nobody offered to pay my way out there by Pullman nor to stow me in a cockpit as ballast, even though I make excellent ballast up to 160 pounds. Something ought to be done about this, Uncle Frank. There ought to be a National Fund for the Transportation of Deserving Journalists to places where they would do the most good, or, on the other hand, to places which would do them the most good. Which reminds me that I should thank you for the flowers. And just why did you send lilies tied with a purple ribbon? Are you over-optimistic or just a bum guesser?

There's a nice view from my room across Fortieth Street. The building on the other side has fourteen stories and 24 layers of bricks to the story, so you can figure it out for yourself. The nurse is still a blonde, and here it is Tuesday already.

* * *

Dear Uncle Frank:

April 18, 1928

I was wrong about the building across the street. It has 25 bricks to the story and not 24, which throws all my careful calculations out of whack. And the nurse is not only a blonde but she's also Irish. She read in the papers that this Flying Irishman might get in to New York today from the frozen North, and for that I haven't had my face washed this morning. These New Yorkers certainly take their pleasures seriously, and aviation has been a wonderful thing for them, and given them about twice as many excuses for celebrations as they ever had before. They talk about aviation sweeping the country, but the biggest sweeping job is that of the White Wings who sweep up New York after a parade of welcome.

I've tried to argue with her. I've tried to tell her that she should give a kind thought to the motion picture boys and advance agents who risked their all and wrecked their expense accounts to be on the spot where the *Bremen* sat down, before somebody skimmed all the gravy. But you can't argue with a nurse. A nurse is a wonderful compound of nature and science,—trained like a doctor, reg-

(Continued on next page)

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20 x 4 tubes for same	2.25
Complete set of two wheels, tires & tubes	36.00
26 x 4 new production clincher wheels	11.00
26 x 4 good used clincher wheels	8.00
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26 x 4 new production grey tubes	2.25
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7.50 x 1.25 new tubes	3.50
Complete set of two wheels, tires & tubes	50.00
20 x 4 new production straight side wheels	13.00
20 x 4 new production straight side tires	11.00
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No. (4) Gabardine helmets, silk lined. Regular hat sizes, buckle and strap, goggle straps	2.15

THE Navy Department hereby invites and will receive until twelve o'clock noon, Thursday, Aug. 9th, 1928, (1) Competitive designs for a rigid airship of approximately six million cubic feet volume, designs to be submitted in accordance with section 10 (a) to (h) inclusive of the Aircraft Procurement Act approved July 2, 1926 (44 Stat., Part 2, page 780); price for designs and bid for construction of one and of two rigid airships to be submitted in accordance therewith, as provided in subsections (a), (b) and (e) of section 10 of said act; (2) Bids for one and for two experimental rigid airships of approximately six million cubic feet volume, parts and accessories; and (3) Proposals for construction of one and of two rigid airships in accordance with Navy Department's specifications. Circulars giving full detailed information may be had on application to the Navy Department, Bureau of Aeronautics. Curtis D. Wilbur, Secretary of the Navy, April 18, 1928.

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Set of three navigation lights, $6.50. Dandy oil or water temperature gauge with tubing, $8.50. Dyke's New Aircraft Engine Instruction Book, $5; Modern Aircraft, $5; Primer of Air Navigation, $2.50.

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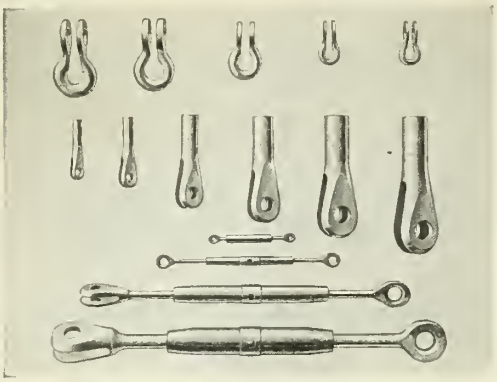
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(Continued from preceding page)

istered like a Holstein cow, starched like a full-dress shirt and salaried like a bank president. And she knows how to do miracles; she can make a five-foot sheet cover a six-foot bed. So if you can't be healthy, for goodness' sake be careful, and anyway, never argue with a nurse.

You know, Uncle Frank, it may be the result of too much operations and the fact that my coffee is always cold before I can circumnavigate my tray to it in the morning, but I'm not nearly as much excited over long-distance puddle-jumping as I used to be and no doubt ought to be. I was out in Chicago last week, and spent the evening out along the North shore, and there I picked up a thrill which beats anything I can get out of the hysterics of the morning papers which are brought to my bed of pain. Not that the bed really suffers so much, but you know what I mean. Well, anyway, I was there outside Chicago in the dark of the evening, and out of the quiet air there came a throbbing hum, and even I knew it for an airplane motor going about its proper business. And pretty soon a double star of colored light came up across the horizon and crept straight up the sky over my head, and it dawned on my simple Eastern mind that the night mail was on its way in; that behind those light were the wings of a plane, and behind those wings the steady hand and heart of a man, bringing his ship home to roost, straight as an arrow on his chartered course and right on schedule time. "Whee", says I, with my hair sticking pleasantly up on end with excitement, "that must be a night mail plane." The Chicagoans regarded me kindly but curiously. "Of course," says they, looking at their watches. "He goes by every night at this time."

Now, I ask you. Isn't that the last word in the new language of the new century? The night mail is in and it comes by air and we set our watch by it. Don't talk to me about Transatlantic tours from the middle of nowhere to the front pages of the daily press. Heroic they are, but there's a better kind of solid satisfaction and a more prideful thrill in the faithful heroism of the daily job well done.

It's getting to be sort of lonesome over here. I've counted all the bricks across the street and I know every slat on this bed. There's an empty room across the hall and another blonde nurse running around foot-loose. Come on over.

* * *

April 19, 1928

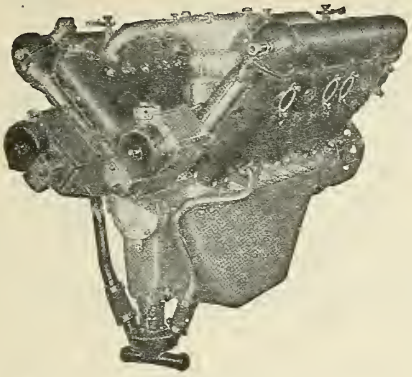
Dear Uncle Frank:

Well, I'm going to get outen here. Doc Montague came in to see me,—he's the gent who tore me down and reassembled me without losing any essential pieces, and I want you to know that he knows his motors,—and he says I might as well go home and be bad-tempered with my own wife as stay here and take it out on the staff. We had a nice little chat together, he being the sort of doctor who treats you as a person and not simply as another entry in the day-book, and he told me something about the appendectomies and tonsilectomies and other ectomies that go on here day after day. It was mighty interesting; much more so now than it might have been before I took my own beating, and I soaked it up like a sponge.

And I've found a moral in it. I'm good at that; I can find a moral in almost anything, whether it has one or not. I found one once in a ferryboat to Jersey City and I found two in the Philadelphia subway, and I may as well tell you now that I found one once in the office of AERO DIGEST, in the second waste-basket to the right as you enter.

(Continued on next page)

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(Continued from preceding page)

There are more miracles to the square inch in a modern hospital than almost anywhere else in the world, and I'm not just referring to the nurses. They repair, rebuild and remodel people there; they wipe out countless years of human suffering; they take the knocks out of the human engine and tune it up for long years more of useful service. Every one of these jobs is a miracle of our times, and every one of them,—to the people most concerned and their relatives, heirs and assigns,—is a thing to be shouted to the world. That's why people will insist on talking about their operations, even though it is quite clear that there's no more credit in surviving a successful operation than in picking up a hundred honors in a bridge game. But to the doctors who do the job, these things are a part of the day's work. The days of first discoveries are in the past, and they are now daily applying their knowledge and skill to the betterment of the happy family of humanity. They don't talk much about it; they seem, in fact, almost casual as they take you in hand, fix you up and send you home again. But the miracle and marvel of it are none the less a fact simply because they have become almost a habit.

I feel somewhat the same way about this flying business. History records first performances, first flights, first triumphs over perils and problems. Heroes will find places in aviation's Hall of Fame, because they first broke a trail or dared a barrier. The man in the street applauds the record-breaker, and will continue to do so until the last possible variation has been worked on the record flight; until, for instance, someone flies across the Atlantic with his tail to the wind to keep the dust out of his eyes, or does a non-stop flight on a ham sandwich from Hoboken to Jersey City. But the real thing that counts for progress is the assimilation of these performances into the habit of regular business,—regular flying, regular schedules, regular routes, regular airways and airports. And it won't be until the man in the street takes his eyes off the dramatics that he will get a full picture of what aviation already can mean to him and will mean to him in the near years to come. He can still find plenty of heroics and thrills, but they will be born out of his own daily experiences with civilizations newest servant, which, I believe, will always be a field rich with romance for the man of imagination.

You can see it is about time I left the hospital since I'm getting serious and thinking on my sins, not to mention the fact that somebody else wants this bed. I'm going home by cab, subway, train and automobile, but in my present condition of structural weakness I wish I were going by air, for I couldn't pass a Department of Commerce inspection right now if the inspector were my brother-in-law and owed me money, and I'll be washed out if we hit a cobblestone. Unfortunately there's no airplane going my way, and mighty poor facilities for taking off from a tenth floor on Fortieth Street. If you're not too busy, you might get busy and do something about that.

And after I've been out to see the boys on my favorite flying field, which is the one where I get a ride sometimes when they want to use a deadhead for live bait, maybe I'll think of something to write you a piece about. It's getting to be almost as hard to find something new to say about aviation as it is for a pilot to get his smiling but intrepid picture in the papers. And that, between you and me, is a sure sign that this aviation business is getting to be regarded as respectable.

Hoping you are the same, I am
Yours with love

Don Rose

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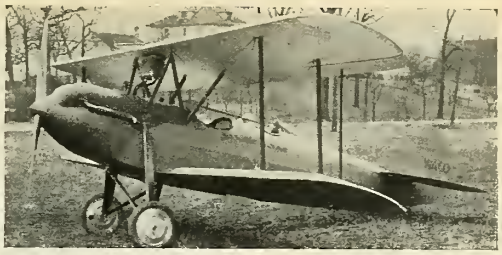
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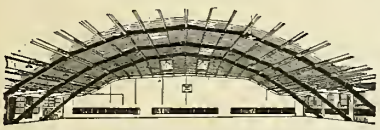
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A NOD AND A WINK

(*Continued from page 753*)

same thing on malted milk.

At 7 a. m. we parted regretfully and went to bed, because, after all, one must be moderate in the use of cracked ice, lest he chill his stomach. I slept in George's room, while he went to Commodore Erickson's room, which boasted an extra bed—with all that ice aboard we wanted space in which to roll. The night before that I had slept in a bed in the Kendall hangar. I never did occupy my own room—and I don't know who did. But I suppose there was someone in it. I had registered to occupy that room with Will Rogers of AERO DIGEST, but I lost track of him. I think he stayed with George McLaughlin or Eddie Stinson. Eddie had a room, too, but he wouldn't stay in it. A hotel manager must be an expert in differential calculus in order to sort out his various roaming roomers.

At one p. m. Saturday Commodore Erickson came in, woke me up, and turned on the radio—there's a new annoyance of hotel life. "How are you?" he says. "Fine," I groaned. "How's George?" "He's great, too," said the Commodore. "I'll send you a glass of champagne—that will fix you up. Get dressed and come up for breakfast." Well, what with the champagne and a shower and a couple of hairs of the dog that bit me (a Scotch terrier), I rushed off to breakfast, feeling like a paralyzed earthworm with creeping paralysis. And there was old George still in bed, but looking pretty chipper after all he'd been through. Then we had breakfast—six raw eggs apiece in vinegar, pepper, and salt, with coffee—and there we were, pleasant and glowing as a couple of hot dogs—and about as lively.

Anyhow, we thought we'd have just as much fun sitting talking and using the ice and adornments as we would have going to the Aircraft Show, so there we sat. Most of the Show drifted in sooner or later, so all we really missed was the airplanes. Some of the boys even offered to go and bring one in for us, but we said never mind, we'd see one some day, and perhaps go some place in it—say, non-stop from Newark to Hoboken.

Then in drifted my friend Harry West, ex-Flight-Sergeant of my old 102 Night-bombing Squadron in France. So around went the glasses, and the last I recall about 11 p. m. Wes was describing to George and Eddie Stinson how he'd helped Bleriot to fly the English Channel. Then I remember a ride in a taxi, and a railroad station, and the porter pulling at me and saying, "You belongs in Uppah Seben an' heah you is in Lowah Foah."

Well, it was a great show. I almost wish I had seen it.

RECORD ALTITUDE FLIGHTS

(*Continued from page 750*)

the path of the falling plane, took a chance on his own life and remained with the burning, disabled ship. After skillful maneuvering he finally landed the shattered plane safely in a corn field located on the outskirts of the city, not far from the Naval Air Station. The barograph placed nearest to the engine was entirely destroyed by the flying engine parts and by fire. The other instrument, which was located near the cockpit and protected by the fire-wall, was found to be in good condition. Calibration at the Bureau of Standards on the day following the flight showed that the instrument functioned perfectly in spite of the excessive vibration that was experienced after the disintegration of

the engine. From the record of this instrument the ceiling pressure was determined to be 147.4 millimeters of mercury. From the F. A. I. table, 148 millimeters is equivalent to 11,710 meters or to 38,418 feet. At a later date this was known to be a world record for landplanes.

About a month after this flight, or in the early part of September, the aviation world was startled by the announcement that Jean Callizo, the supposed world-record holder for altitude with airplane, had been guilty of fraud in falsifying his barograph record. French engineers, doubtful of the performance of their plane, had secretly inserted an additional barograph in the wing of the plane. After the flight, in which Callizo purposed to better his former records, the secret barograph was inspected. The trace showed a relatively low altitude at the ceiling, exposing Callizo as a fraud. He protested for a while, but finally admitted tampering with his instruments and that his altitude flights had been fraudulent. As a result, the Fédération Aéronautique Internationale decided to disqualify all former flights made by this pilot. The world altitude record for an airplane then reverted to Lieutenant Champion, and America can justly acclaim her courageous man of the air who had made such a dramatic and successful struggle in attaining it.

On August 18th, at San Diego, California, Lieuts. H. C. Rodd and B. J. Connell, U. S. N., made an altitude flight with a PN-10 seaplane constructed at the Naval Aircraft Factory at Philadelphia The ship was provided with two Packard engines of 600 h.p. each and carried a sand "pay load" of 3,500 kilograms (7,726 pounds). The sand was carefully weighed on scales certified by a representative of the Division of Weights and Measures, of the Department of Agriculture. A little additional sand was added in order to take care of the unavoidable sifting-out which is caused by the vibration of the plane. After the flight to an altitude of 2,000 meters, the sand was again weighed, in order to certify that at least the 3,500 kilos "pay load" still remained. On this flight, two single traverse barographs were carried,—the official one of which recorded a ceiling pressure of 592.4 millimeters of mercury. From the F. A. I. table, 592 millimeters of mercury is equivalent to 2,008 meters, or to 6,588 feet. No thermograph was carried, but the temperature at the ceiling of the flight was noted by the pilot to be +21 degrees Centigrade. This was another world record for a seaplane,—this time one carrying a 3,500 kilogram useful load to an altitude of 2,000 meters (6,562 feet).

On November 4th, at Scott Field, Belleville, Illinois, exactly six months after his former flight, Captain Gray for the third time set out to capture the balloon altitude record as well as to make further scientific observations,—meteorological and radio. The Fédération Aéronautique Internationale did not allow Captain Gray's altitude mark of May 4th as a world record for the reason that "he was not in possession of his ship and instruments" when he landed. (It will be recalled that he was forced to use his parachute in order to save himself and his instruments from a crash due to a too rapid descent of the balloon.) On this last flight of November 4th, Captain Gray carried the usual high altitude equipment and improvements for unloading the sand ballast of the ship. Among the paraphernalia in the basket of the balloon was an Atwater Kent radio set with which he spent much time during his upward climb, obtaining as much data as possible by "listening-in" on the various broadcasting stations. He could have ascended much more rapidly, reached his ceiling and descended, most probably, before exhausting his oxygen supply. His pre-

(*Continued on next page*)



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(Continued from preceding page)

vious flight of May 4th required only one hour on the ascent, and about the same time on the descent. On this particular flight, however, the barograph record showed that two hours were consumed in reaching the ceiling, and as before, about one hour in returning to earth. The log kept by Captain Gray specifies that all was well at 40,000 feet when the last bag of sand was unloaded. The actual log written by Captain Gray was examined by the author.

The lowest temperature recorded by Captain Gray was —40° Centigrade at about 34,000 feet and above this level higher temperatures were observed. It is well known by meteorologists that the temperature of the air ordinarily decreases with altitude only up to about 30,000 to 35,000 feet in the United States, above which altitude the temperature is either constant or increases irregularly.

An examination of the barograph trace showed a sudden upward trend following the unloading of each bag of sand. Towards the ceiling of the flight the radio battery was known to be one of the last things to go overboard. The consequential lightening and sudden climb of the balloon could be detected in the trace. From the mute evidence as given by the barograph, Captain Gray appeared to be conscious at the ceiling of the flight and had valved gas in order to come down. A balloon, however, returns to earth at a much slower rate than an airplane and it is believed that the oxygen supply of the ship was not sufficient to carry him safely through. As a result, he landed with his balloon about an hour later in a tree near Sparta, Tennessee. Had the country folk at this place been inquisitive enough, they might have investigated right away, and found the pilot crouched down inside of the basket, unconscious it is true, but most probably living. This conclusion is based on suffocation experiments performed on various animals. Cases have been noted where animals have been "out" as long as an hour, and then revived when given proper treatment. In the case of Captain Gray, recent investigation indicates an out-of-oxygen period of certainly not more than 15 or 20 minutes. Again, in the cases of apparent drowning, patients have been revived after long periods of suffocation. Hence, it may be seen that medical attention or prompt artificial respiration at that critical time of landing might have pulled him through. As it was, some youngster climbed the tree on the following day when it was too late and found the airman in the basket—dead. Thus ends the story of the ambitious pilot who died in the interest of science and who incidently established what we hope to be a recognized world altitude record for a balloon. The recording instruments were the same as those carried on the flight of May 4th. The clockwork of one barograph stopped running soon after the take-off. The indications from this instrument were that Captain Gray had made efforts to start it running again. It may be of interest to note here that the clockwork of this instrument despite the cleansing by a jeweler had apparently retained some lubricating oil, while the other instrument that continued to run throughout the flight did so because the bearings were entirely clean and dry. The latter technique appears to be the safest to pursue in all high altitude flights. The thermograph carried in this flight indicated a minimum instrumental temperature of minus 40 degrees Centigrade which agreed with the minimum temperature entered in Captain Gray's log. The barograph selected as official, functioned perfectly throughout the flight and, on calibration at the Bureau of Standards, showed a ceiling pressure of 121.9 millimeters of mercury. This was 0.3 millimeter lower than that of the former flight. On rounding off to the even millimeter, however, according to the usual F. A. I.

requirements, the altitude proved to be the same as that on the former flight of May 4th; that is 12,944 meters or 42,470 feet. This altitude is the highest ever attained by man,—exceeding that of Lieutenant Champion in a landplane by approximately 4,000 feet. Early in January, 1928, the Fédération Aéronautique Internationale announced that it would not allow Captain Gray's record because "he was not in possession of his ship and instruments" when he landed. However, the annual conference, which meets at Brussels next August, will be asked to consider the case again, at which time another decision may be rendered.

On the 21st of December, Renato Donato, an Italian pilot, made an altitude attempt at Turin, Italy, with an AC-3 Dewoitine-Ansalde airplane powered with a Jupiter IV-Romeo 600 h.p. motor. The engine, running on a light aviation spirit and castor oil, gave perfect performance throughout the flight, despite the fact that a temperature of minus 60 deg. Centigrade was experienced at the greatest altitude. The machine reached 3000 meters (9840 feet) in four minutes, 5000 meters (16,400 feet) in nine minutes, and the maximum height 11,753 meters (38,559 feet), in 42 minutes. He reached an altitude which exceeded that of Lieutenant Champion's flight on July 25th, but according to the rules of the Fédération Aéronautique Internationale it is necessary to exceed a previous altitude mark by 100 meters (328 feet) in order to establish a new world record. As a consequence, Lieutenant Champion still appears to be the champion, and the coveted altitude record remains with the United States.

For ready reference a summary of the flights made in 1927 is given in the following table:

Date of flight (1927)	*Pilot's Name*	*Type of Aircraft*	*Barometric pressure at ceiling (mm. mercury)*	*F.A.I. altitude at ceiling (meters)*	*F.A.I. altitude at ceiling (feet)*
Mar. 9	Capt. Gray, USA	Balloon	235	8,690	28,510
Apr. 14	Lt. Henderson, USN	Seaplane (500 kilo load)	312	6,760	22,178
May 4	Capt. Gray, USA	Balloon	122	12,944	42,470
May 5	Lt. Champion, USN	Seaplane	187	10,197	33,455
July 4	Lt. Champion, USN	Seaplane	151	11,581	37,995
July 25	Lt. Champion, USN	Landplane	148	11,710	38,418
Aug. 18	Lts. Rodd & Connell, USN	Seaplane (3500 kilo load)	592	2,008	6,588
Nov. 4	Capt. Gray, USA	Balloon	122	12,944	42,470
Dec. 21	Renato Donati (Italy)	Landplane	147	11,753	38,559

STATEMENT OF OWNERSHIP, MANAGEMENT, CIRCULATION, ETC. REQUIRED BY THE ACT OF CONGRESS, AUGUST 24, 1912.

of AERO DIGEST, published monthly at New York, N. Y., for April 1, 1928.

State of New York, } ss.
County of New York, }

Before me, a Notary Public in and for the State and county aforesaid, personally appeared Frank A. Tichenor, who, having been duly sworn according to law, deposes and says that he is the Business Manager of the AERO DIGEST, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations, to wit:

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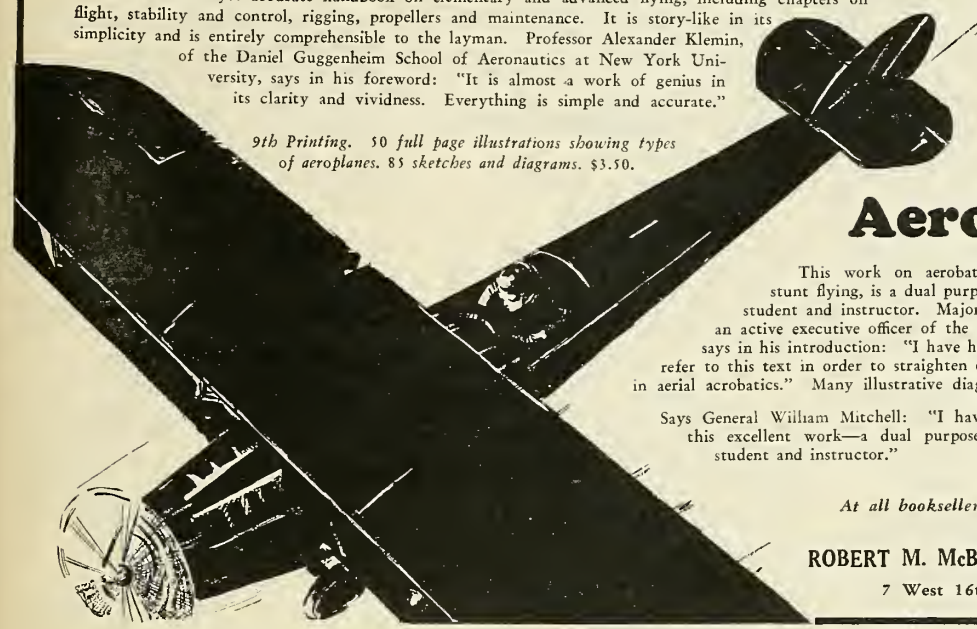
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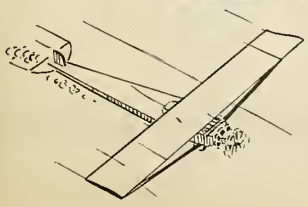
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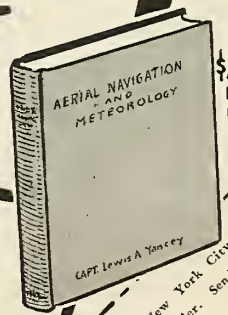
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Wright Aeronautical Corporation 805

Yancey, Captain Lewis A. 887
Yoho and Hooker Lumber Company 889

Zimmerman, Paul G. 888

CITY Airport of Winfield, Kans., has Butler STEEL HANGAR

The hangar shown below was just finished for the city airport of Winfield, Kansas. This Butler Steel Hangar was ordered by City Manager Jack Welfelt through the McGreagor Hardware Company of Winfield.



THE all-steel construction of the Butler Hangar assures the city of Winfield that it will have a structure that is non-combustible, fire-resistant. The wall and roof sheets are 24 gage tight coated galvanized steel. The frame is steel. All steel sheets are bolted to the steel frame with *galvanized* bolts.

ALL sheets have deeply drawn paneled corrugations. These corrugations are deep and wide. They are specially pressed in the Butler factory and are deeper and wider than mill corrugations. Combined with the Butler bolted construction, these corrugations assure extra strength and rigidity to the hangar.

THERE is plenty of light for all working conditions.

THE wheels of the doors are equipped with roller bearings. The doors operate easily.

THE Butler Steel Hangars are complete.

THEY may be economically enlarged. They may be dismantled, moved and re-erected with practically 100% salvage.

SAVES TIME
In Refueling Planes



The Butler Truck Tank saves time in refueling planes. Made of steel, welded. Different compartments hold definite quantities of gasoline or lubricating oils. Provided with power or hand driven pumping unit for transferring gasoline from truck tank to airplane. Write for prices.

Desirable Information

Butler Steel Hangars are available for individual planes or for many planes. If you desire information on a fire-resistant hangar or on airport problems, feel free to write us. Literature and attractive prices will be sent on request.

TRADE STEEL BUTLER PRODUCTS MARK

Butler Manufacturing Co.

Kansas City, Mo. — Minneapolis, Minn.

At the *All-American Aircraft Show . . .*

Practically every plane powered with a modern American-made engine, was equipped with an Eclipse Aviation Engine Starter—reflecting emphatically the trend toward greater reliability, safety and convenience in starting.

Eclipse Aviation Engine Starters are available in a wide range of types and sizes particularly adapted to application on all modern domestic engines. In designing new motors or in modernizing present motors by the application of starting equipment, a co-operative technical service, with a background of twelve years' experience, is at your command. Write for full information stating engine in which you are interested.

ECLIPSE MACHINE COMPANY
East Orange Plant, East Orange, New Jersey
Elmira, New York · Walkerville, Ontario

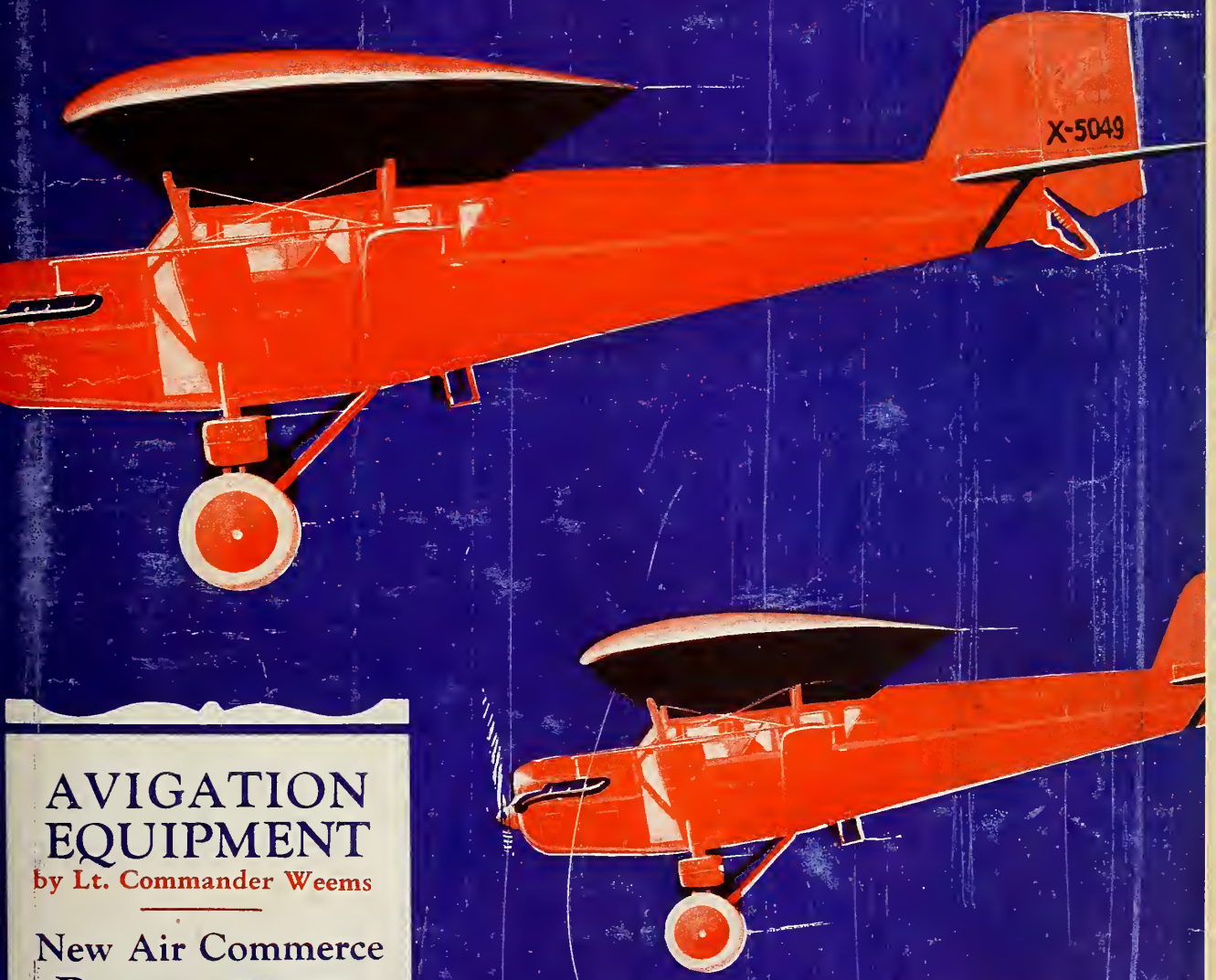


ECLIPSE

AVIATION STARTERS AND GENERATORS

. XII No. 6 JUNE 1928 25 CENTS

AERO DIGEST



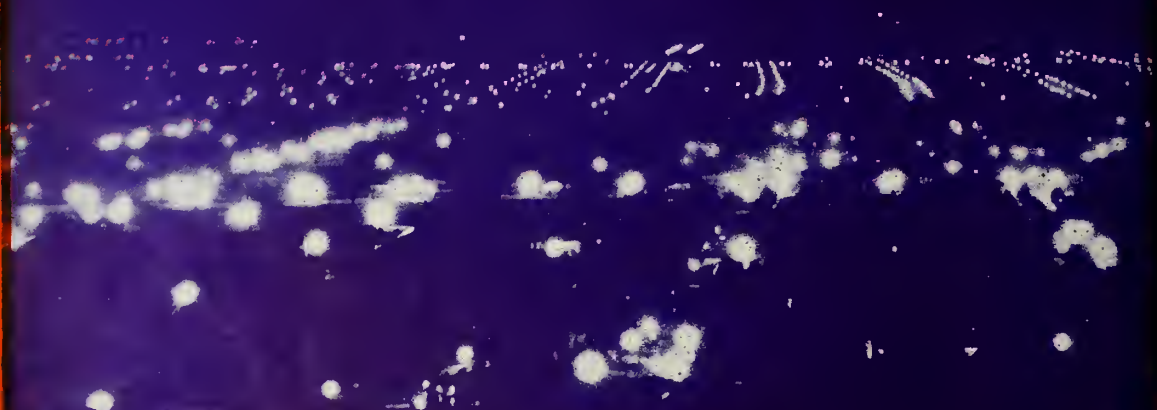
AVIGATION EQUIPMENT
by Lt. Commander Weems

New Air Commerce REGULATIONS

"Alice *in* Navyland"
by Cy Caldwell

DEPENDABLE





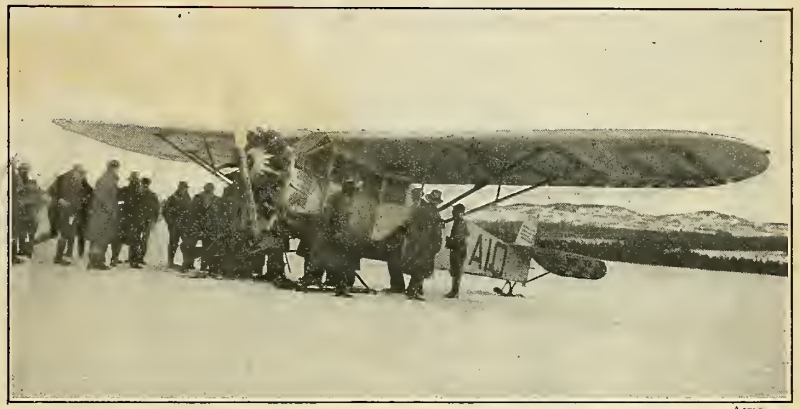
MENASCO MOTORS CO.

6718 McKINLEY AVE. LOS ANGELES

AERO DIGEST. *June, 1928. Published every month. Volume XII, Number 6. Publication office, 220 West 42nd Street, New York, N. Y. Subscription price $3.00 a year; single copies, 25 cents; foreign subscriptions, $4.00. Entered as second-class matter July 17, 1922, at the Post Office at New York, N. Y., under the Act of April 3, 1879. Copyrighted, 1928, by Aeronautical Digest Publishing Corporation.*

Fairchild FIRST Again . . .





Acme

The FIRST *to reach the disabled Bremen—the Fairchild Cabin Monoplane*

THE first 'plane to reach the Bremen's crew at Greenly Island was a Fairchild Cabin Monoplane. No sooner was the distress of the disabled Bremen known, than C. A. (Duke) Schiller and Dr. Louis Couisiner of the Transcontinental Airways, Ltd. of Canada, volunteered to carry aid to the three intrepid airmen . . . Baron Gunther von Huenefeld, Major Fitzmaurice and Captain Hermann Koehl.

Through almost a thousand miles of rain, snow, sleet and fog, the Fairchild rescue 'plane plied its course from Murray Bay to Greenly Island. No more hazardous or unfavorable a flight could be contemplated . . . into the very jaws of disaster, many observers predicted. The Fairchild Cabin Monoplane, nevertheless, went through, and brought Major Fitzmaurice back to Murray Bay for spare parts and special fuel for the Bremen.

Of the eight 'planes which subsequently flew to Greenly Island, seven were Fairchild Cabin Monoplanes. The respect with which experienced pilots consider Fairchild 'planes is typified by Duke Schiller's remark, when a Fairchild was suggested as the 'plane for his epic flight—"With that 'baby', we can go to the pole."

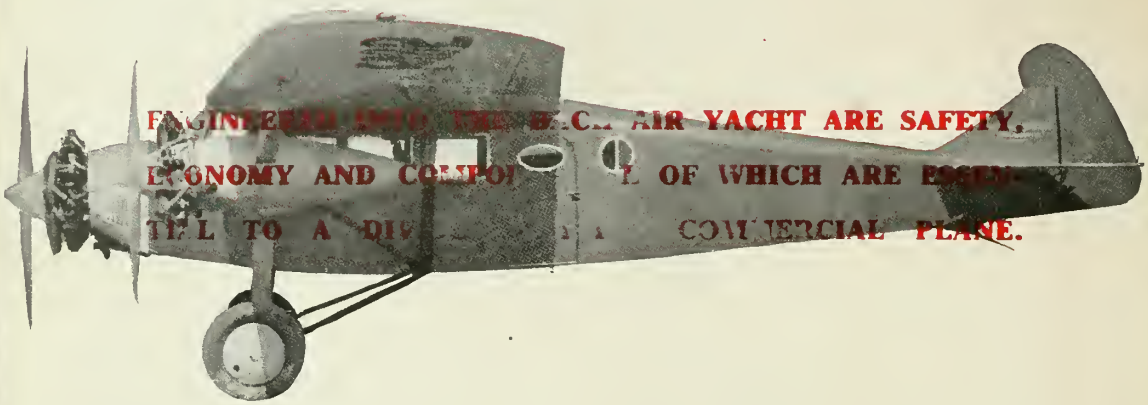
As a result of the experience gained in building more cabin monoplanes than any other manufacturer—all Fairchild 'planes are ruggedly constructed for dependable service over land, water, or ice . . . through sleet, rain and snow as well as in the hot still air of the torrid zone. Fairchild Airplane Manufacturing Corporation, 270 West 38th Street, New York City.

SUBSIDIARY OF FAIRCHILD AVIATION CORPORATION

FAIRCHILD

BACH

BUILT-IN FEATURES



SAFETY

The safety of the "BACH AIR YACHT" is insured by the use of THREE ENGINES, so placed that a well balanced power distribution is obtained, with ability to sustain flight on center engine alone, or cruise on a combination of any two engines.

ECONOMY

From the brake equipped, 17 ft. tread landing gear to door knobs, the "BACH AIR YACHT" is of well balanced design and sturdy construction of combined steel and wood of the very highest grade, all of which tend to make this ship ECONOMICAL, combined with its ability to carry MORE PAYLOAD per horse-power at a GREATER SPEED, with minimum upkeep.

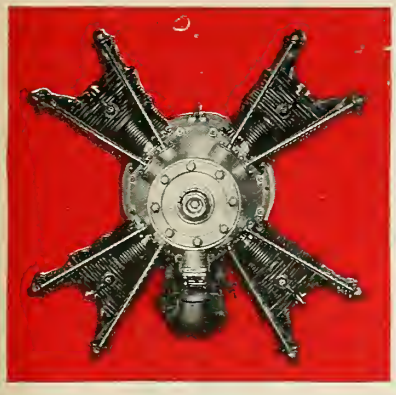
COMFORT

Comfort of the passengers is assured in the pullmanesque heated and ventilated sound-free cabin, equipped with smoker and lavatory, hot and cold running water.

BACH AIRCRAFT COMPANY

Clover Field Santa Monica

California



WHY CAMINEZ?

An engine for aircraft must be more than an engine. It must possess more than efficiency, reliability, minimum maintenance and maximum durability.

It must be supplemented by a thoroughly trained and highly responsible manufacturing organization . . . such as is back of the Fairchild Caminez engine.

With a new factory built on its own flying field . . . with a quarter of a million dollars of individual-drive precision machinery installed and running . . . with a trained organization from metallurgists to service engineers . . . with factory service branches in Chicago, Dallas and Los Angeles—these are but a few of the evident preparations which the Fairchild Caminez Engine Corporation has made to serve this year's demand for low-powered aircraft engines.

The reliability of Fairchild Caminez engines has been proven conclusively by innumerable official tests as well as by extensive flying. A Caminez engine can be serviced or overhauled in a fraction of the time required for other engines, because it has only half as many parts. As a result of the unusual efficiency of its slow-speed propeller, it will climb 40% faster than any ungeared engine of equal horsepower.

Every part of every Caminez engine is made, inspected and tested in the Fairchild Caminez plant, where uniform excellence of materials and workmanship are maintained in the highest degree. An assurance *and insurance to you* that you can depend on service for your 1928 Caminez engine in 1932 or in 1938.

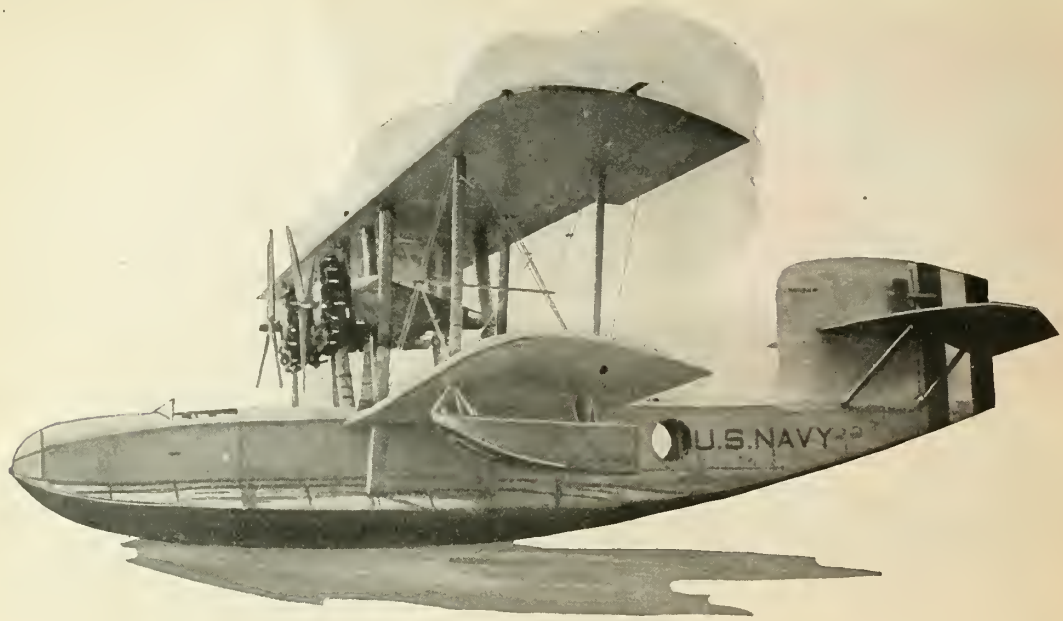
Fairchild Caminez engines are ready to serve your needs—to give you a new performance thrill. They are now used in Kreider-Reisner, Travel Air and Waco 'planes. For performance particulars, specifications and complete data, address the Fairchild Caminez Engine Corporation, Farmingdale, Long Island, N. Y.

SUBSIDIARY OF FAIRCHILD AVIATION CORPORATION



This is the first unit of the FAIRCHILD CAMINEZ ENGINE *plant, the present production of which is fifteen engines a week.*

CAMINEZ ENGINES



PN-12 Breaks Endurance Record

—*with the help of*

AERO MOTOR LUBRICATING OIL

Aero Motor Lubricating Oil was used in both motors of the PN-12 on its flight that exceeded by more than 8 hours the former seaplane sustained flight record. It took off from the Philadelphia Navy Yard May 3rd, at 2:50 p. m. (Standard Time), landing at 2:51 a. m. May 5th, or 36 hours, 1 minute, 13 4-5 seconds. Distance covered equals Lindbergh's flight . . . full load 19,000 pounds . . . crew of four.

The Port Motor, which carried most of the load, used only 16 gallons during the entire flight, or .007 lbs. per BHPHR.

The Starboard Motor, despite the fact that it was throwing oil, used 23 gallons, or .00975 lbs. per BHPHR. The total Aero Motor Lubricating Oil consumed by both motors was 39 gallons, or an average of .008 lbs. per BHPHR.

The oil that made this record was our regular No. 870 Aero Motor Lubricating Oil.

Aero Motor Lubricating Oils, in all required grades, are available in many sections of the country. Write us for the name of the nearest dealer.

Notice

In order to conform with the general practice of using the as our principal trademark, we are substituting same in place of the initials A-M-L-O, our brand which stands for Aero Motor Lubricating Oil. In the future all packages heretofore shipped and sold as A-M-L-O will be labeled as illustrated by the trademark to the right.



TEXAS PACIFIC COAL AND OIL COMPANY

FORT WORTH, TEXAS

38

PLANES

at the FIRST

ALL-AMERICAN AIRCRAFT SHOW

were on

Goodrich Silvertowns

Say you saw it in AERO DIGEST



Advance Aircraft Company · 4 WACO planes on Goodrich Silvertowns

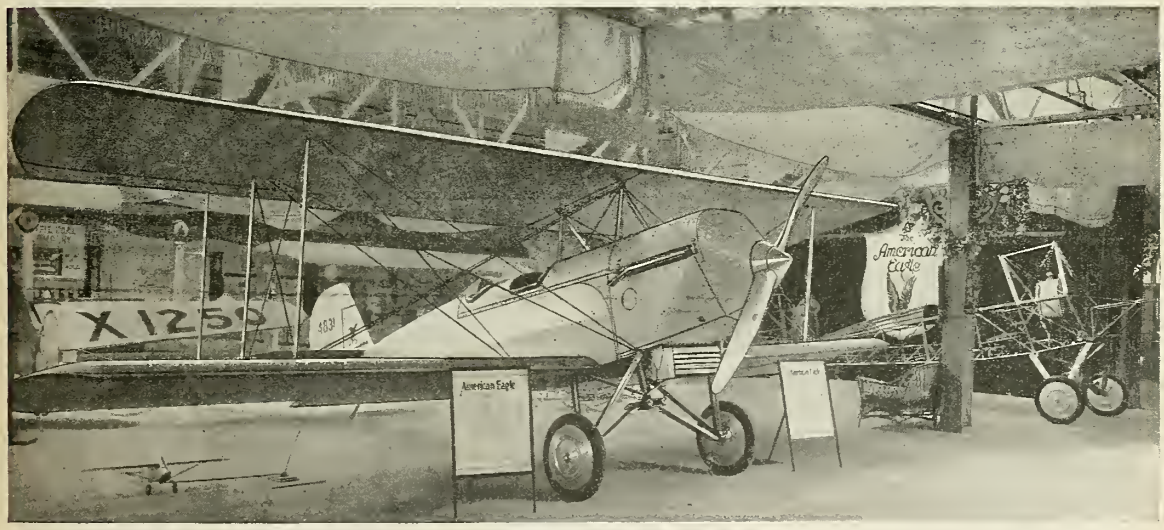


Aero Craft Mfg. Company · AERO CRAFT on Goodrich Silvertowns

Goodrich
At the ALL-AMERICAN



Alexander Aircraft Company · 2 ALEXANDER-EAGLEROCK planes on Goodrich Silvertowns



American Eagle Aircraft Corp. · 2 AMERICAN EAGLE planes on Goodrich Silvertowns

Silvertowns

AIRCRAFT SHOW



Atlantic Aircraft Corporation · ATLANTIC FOKKER on Goodrich Silvertowns



Bellanca Aircraft Corporation · BELLANCA CH on Goodrich Silvertowns



Buhl Aircraft Company · 2 BUHL planes on Goodrich Silvertowns

Goodrich

At the ALL-AMERICAN



Fairchild Aviation Corporation · FAIRCHILD on Goodrich Silvertowns



International Aircraft Corporation · INTERNATIONAL F-17 on Goodrich Silvertowns



Ireland Aircraft, Inc. · IRELAND AMPHIPLANE on Goodrich Silvertowns

Silvertowns

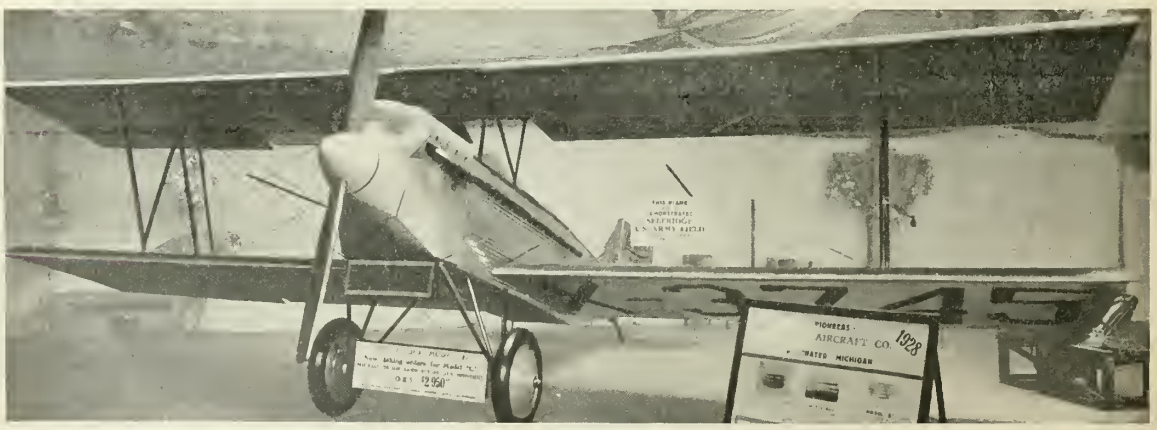
AIRCRAFT SHOW



Kreider-Reisner Aircraft Co., Inc. · CHALLENGER, Type 19 on Goodrich Silvertowns



E. M. Laird Airplane Company · LAIRD WHIRLWIND on Goodrich Silvertowns



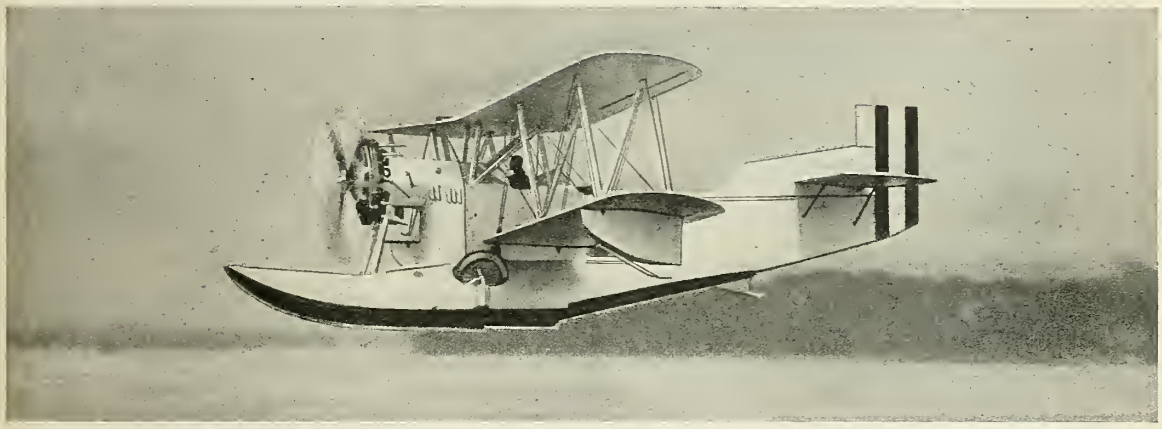
Lenert Aircraft Company · MODEL B on Goodrich Silvertowns

Goodrich

At the ALL-AMERICAN



Lincoln Aircraft Company · LINCOLN PAGE on Goodrich Silvertowns



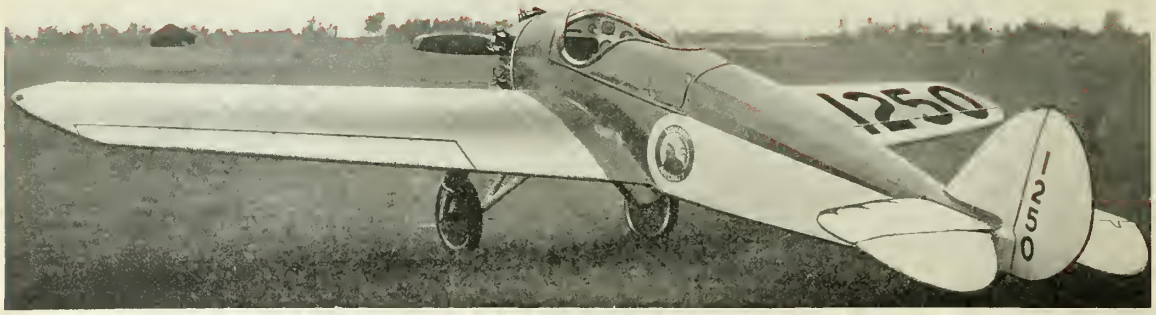
Loening Aeronautical Eng. Co. · LOENING AMPHIBIAN on Goodrich Silvertowns



B. F. Mahoney Aircraft Corp. · RYAN B-1 on Goodrich Silvertowns

Silvertowns

AIRCRAFT SHOW



Mohawk Aircraft Company · MOHAWK on Goodrich Silvertowns



Niles Aircraft Corporation · GOLD TIP on Goodrich Silvertowns



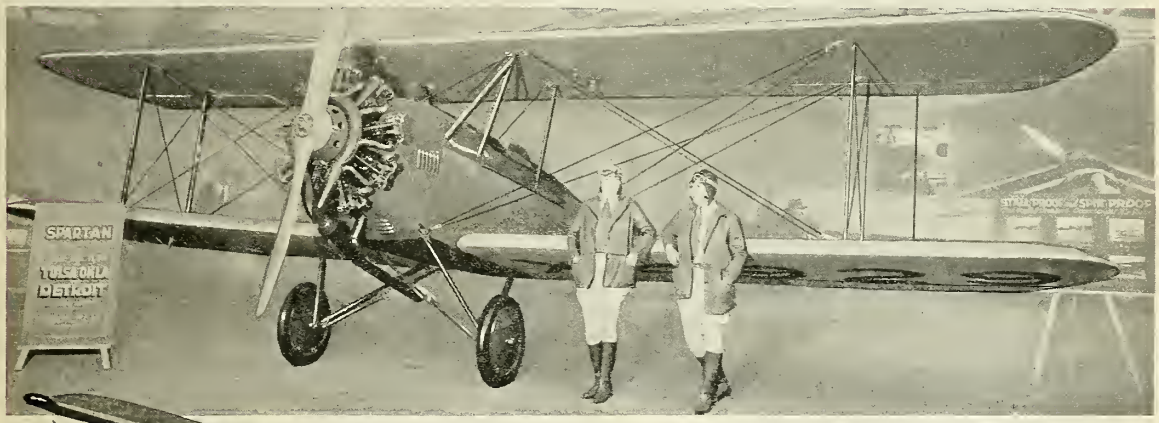
Overcashier Aircraft Mfg. Co. · OVERCASHIER on Goodrich Silvertowns

Goodrich

At the ALL-AMERICAN



Pheasant Aircraft Company, Inc. · PHEASANT H-10 on Goodrich Silvertowns



Spartan Aircraft Company · SPARTAN on Goodrich Silvertowns



Stearman Aircraft Company · STEARMAN on Goodrich Silvertowns

Silvertowns
AIRCRAFT SHOW



Stinson Aircraft Corp. • 3 planes—STINSON DETROITER, PRIDE OF DETROIT and SCHOOL SHIP on Goodrich Silvertowns



Swallow Airplane Company • 2 SWALLOW planes on Goodrich Silvertowns

Goodrich

At the ALL-AMERICAN



Velie Motor Company · MONOCOUPE on Goodrich Silvertowns



Viking Aircraft Company · VIKING on Goodrich Silvertowns

Silvertowns

AIRCRAFT SHOW



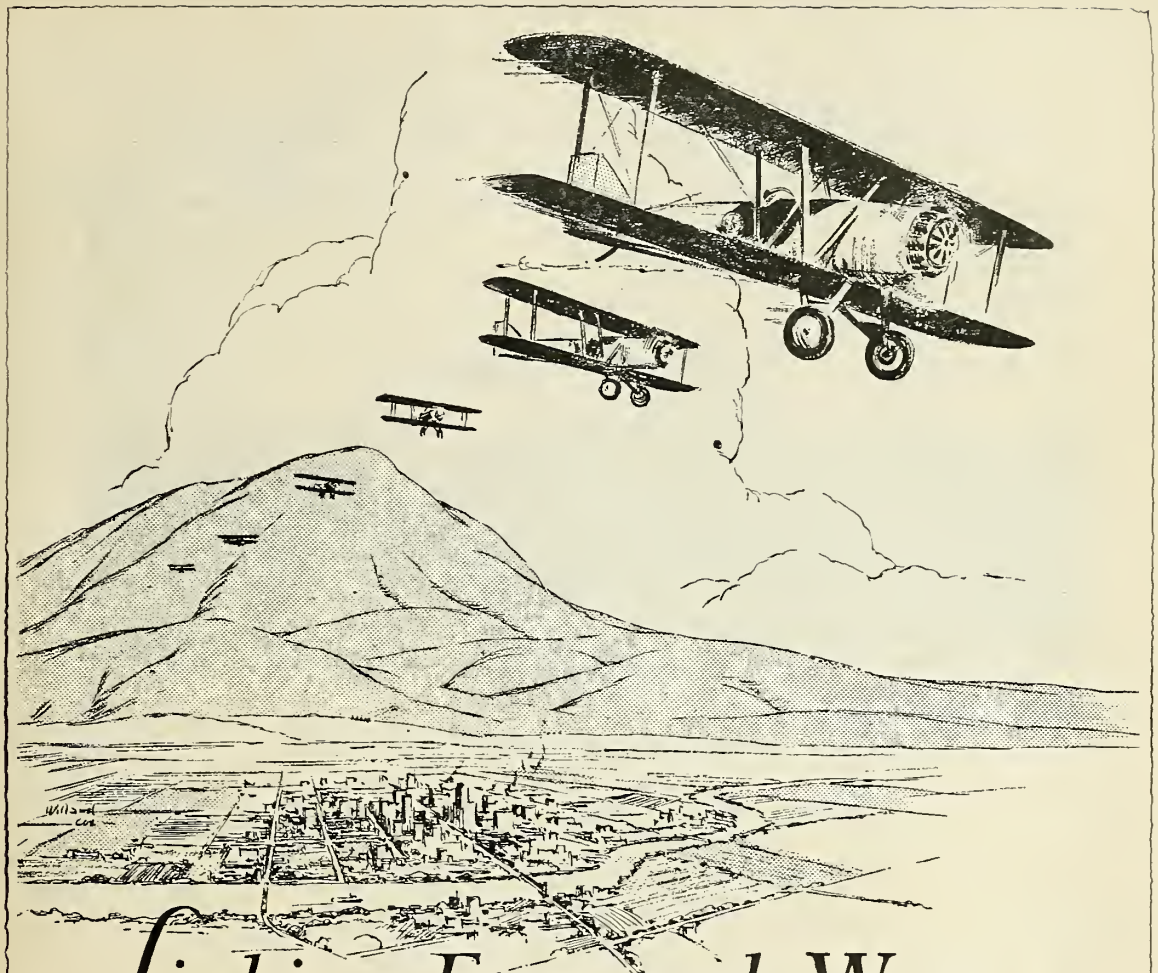
Wallace Aircraft Company · WALLACE on Goodrich Silvertowns



Gillis Aircraft Corporation · CRUSADER on Goodrich Silvertowns

Taylor Brothers Aircraft Corporation · TAYLOR CHUMMY on Goodrich Silvertowns
{Photograph not available}

Goodrich Silvertowns



Linking East and West . . .

BOEING planes have bridged the distance between East and West . . . Chicago, Oakland and San Francisco are now next door neighbors!

Twenty-five mail planes, built by Boeing and operated by the Boeing Air Transport Company, are operating safely and speedily on day and night schedules from the Pacific to the Great Lakes . . . another enviable record and another tribute to the dependability of Boeing airplanes.

BOEING

Boeing Airplane Co.

Seattle, Washington

DA53

Mail by Air and Speed it There

Curtiss

A NEW TRAINING PLANE



The Curtiss Fledgling

The Fledgling was constructed as the winner of a Navy design competition, in which fourteen leading aircraft manufacturers participated.

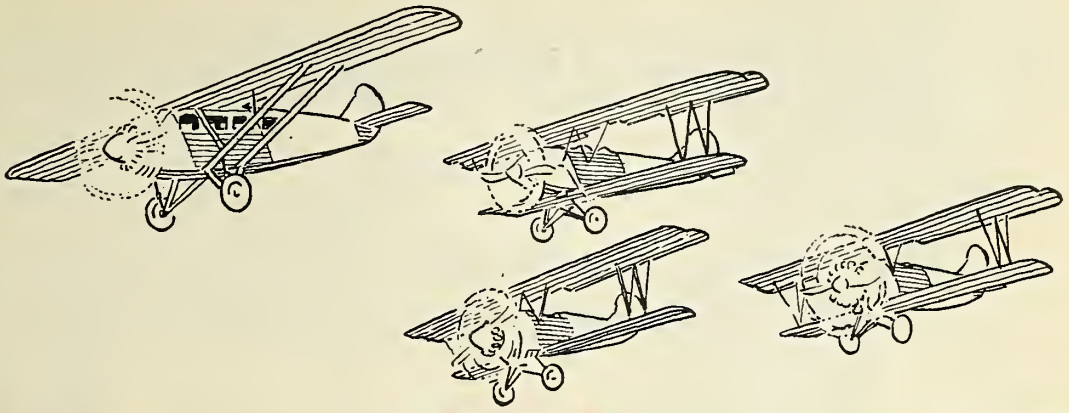
It is specifically designed for primary and advanced training, either as a land plane or as a seaplane, and is equipped for fixed or flexible gunnery instruction, radio spotting and bombing.

In design and performance, the Fledgling is eminently representative of 1928 standards for training planes.

THE CURTISS AEROPLANE AND MOTOR CO., INC.

Offices: Clinton Road, Garden City, N. Y. Factories: Garden City and Buffalo, N. Y.

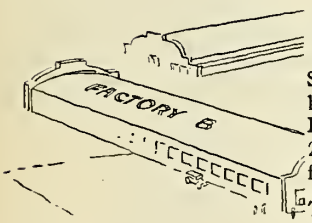
Say you saw it in AERO DIGEST



TRAVEL AIR

Travel Air planes hold many records of accomplishment.

—winner of the 1926 Ford reliability tour.
—winner of the Dole Honolulu flight.
—thousands of flying hours weekly in carrying mail, passengers and express on transport lines.



Six types bi- and monoplanes are now being built, including a new cabin monoplane of Pullman car comfort. Deliveries now average 20 new ships a week from its modern new factory.

Travel Air tests all ships, and fills the tanks of their planes for fly-away, with PHILLIPS 77, knowing that in doing so, the standard of performance of their ships after leaving the factory will be as high as that employed in their manufacture.



PHILLIPS 77 is a stable, 100% natural gasoline made especially for aviation use by *the world's largest manufacturers of natural gasoline.*

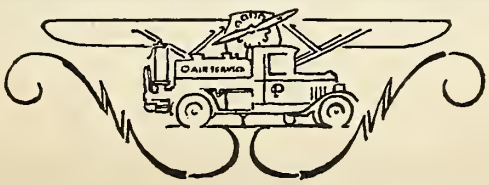


Now available at Chicago, Iowa City, Des Moines, Omaha, North Platte, Cheyenne, Rock Springs, Salt Lake, Wichita, Bartlesville and Amarillo airports.

Phillips Petroleum Company

Bartlesville, Oklahoma

NATURAL GASOLINE FOR CONTROLLED VOLATILITY

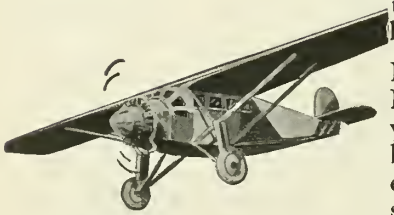


AN IMPORTANT

"to those who are about to learn to fly

You may now learn to fly the Rankin Way in your own locality. In response to demands from prospective students and heads of flying schools the country over, the Rankin School of Flying is granting exclusive rights to teach the famous Rankin System of Flying Instruction to reputable schools throughout the United States. Many schools are already successfully operating under Rankin franchises.

International authorities cite the Rankin pilots' course as the finest known. Because of the outstanding superiority of their training, the demand for Rankin-trained pilots is far in excess of the supply. Established eight years ago, the Rankin School of Flying has grown to the largest in the Western Hemisphere.



If you are about to learn to fly, insist upon Rankin training. If there is no school near you using this great method, mail the coupon below at once for information on how to establish the Rankin System of Flying Instruction in your territory.

MAIL THIS COUPON

AD-1

Rankin School of Flying,
Rankin Airport, Portland, Oregon:

Tell me how to establish the Rankin System of Flying Instruction in my locality.

Name.....Address.....City.....State.....

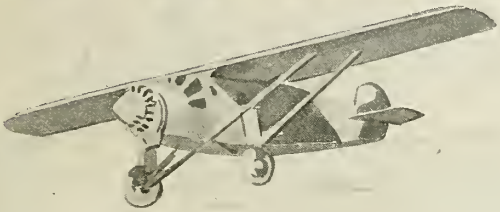
Name of nearest flying school.....

Address.....City.....State.....

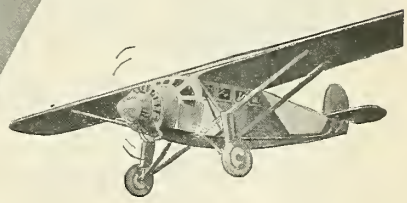
RANKIN SYSTEM OF

Say you saw it in AERO DIGEST

ANNOUNCEMENT





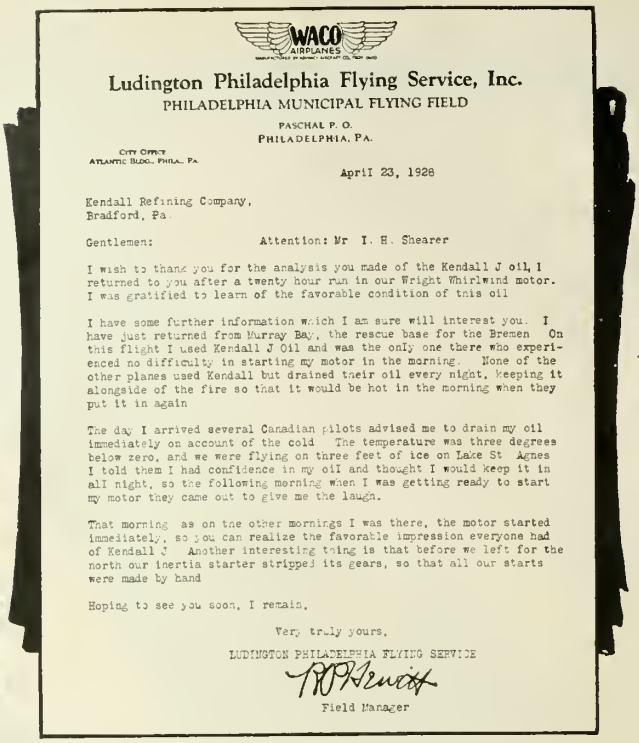


TO FLYING SCHOOLS

Possession of the Rankin franchise places in your hands the most advanced methods of flight instruction known. It puts your school under the personal supervision of the great Rankin organization. The highly trained Rankin business and sales forces are at your disposal backed up by intensive national advertising campaigns. Greatly increased enrollments without any additions to your present staff and equipment, enlarge your income and permit you to maintain the finest school in your territory. Write now to the Rankin School of Flying, Portland, Oregon, for complete details on what this great offer means to you.

FLYING INSTRUCTION

Say you saw it in AERO DIGEST



WACO AIRPLANES

Ludington Philadelphia Flying Service, Inc.

PHILADELPHIA MUNICIPAL FLYING FIELD

PASCHAL P. O.
PHILADELPHIA, PA.

CITY OFFICE
ATLANTIC BLDG., PHILA., PA.

April 23, 1928

Kendall Refining Company,
Bradford, Pa.

Gentlemen: Attention: Mr I. H. Shearer

I wish to thank you for the analysis you made of the Kendall J oil, I returned to you after a twenty hour run in our Wright Whirlwind motor. I was gratified to learn of the favorable condition of this oil

I have some further information which I am sure will interest you. I have just returned from Murray Bay, the rescue base for the Bremen On this flight I used Kendall J Oil and was the only one there who experienced no difficulty in starting my motor in the morning. None of the other planes used Kendall but drained their oil every night, keeping it alongside of the fire so that it would be hot in the morning when they put it in again

The day I arrived several Canadian pilots advised me to drain my oil immediately on account of the cold The temperature was three degrees below zero, and we were flying on three feet of ice on Lake St Agnes I told them I had confidence in my oil and thought I would keep it in all night, so the following morning when I was getting ready to start my motor they came out to give me the laugh.

That morning as on the other mornings I was there, the motor started immediately, so you can realize the favorable impression everyone had of Kendall J. Another interesting thing is that before we left for the north our inertia starter stripped its gears, so that all our starts were made by hand

Hoping to see you soon, I remain,

Very truly yours,

LUDINGTON PHILADELPHIA FLYING SERVICE

R P Hewitt

Field Manager

"All other pilots drained their oil every night, keeping it alongside the fire."





"I told them I had confidence in my oil and thought I would keep it in all night."

AT MURRAY BAY

Rescue base of the Bremen

WHEN the other pilots at Murray Bay drained their oil every night and kept it alongside the fire, R. P. Hewitt, with KENDALL PENZBEST Motor Oil in his plane, did not drain the oil at night and easily started his plane by hand the next morning.

Whenever put to the test, KENDALL PENZBEST Motor oil demonstrates its low cold test. This is why it has a longer life in any temperature, lasts two or three times as long as the average motor oil.

As every pilot knows, wax is not a lubricant and, if not removed, will contaminate the oil. Under high pressure and high temperature, it will change into a carbon formation and deposit a useless residue that impairs the lubricating efficiency of the oil.

Because of their freedom from wax, KENDALL PENZBEST Motor oils do not ordinarily require changing until after about thirty hours of flying and give better lubricating results every hour of flight.

KENDALL REFINING COMPANY

BRADFORD, PA.

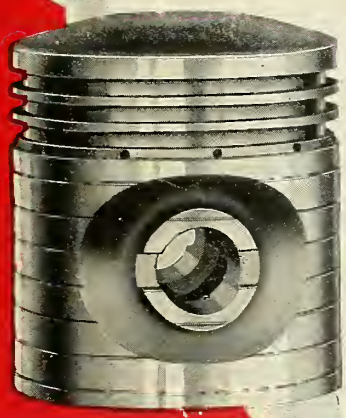
"The following morning when I was getting ready to start my motor, they came out to give me the laugh. All our starts were made by hand."



KENDALL PENZBEST MOTOR OIL

BOHNALITE

The Latest Process Light ALLOY

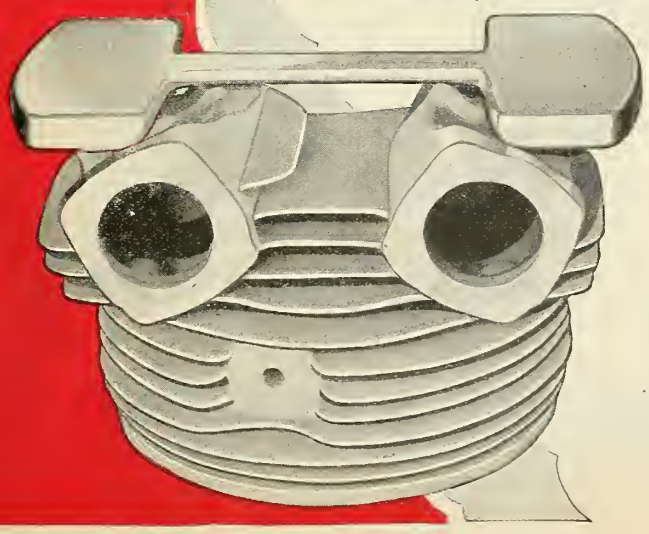


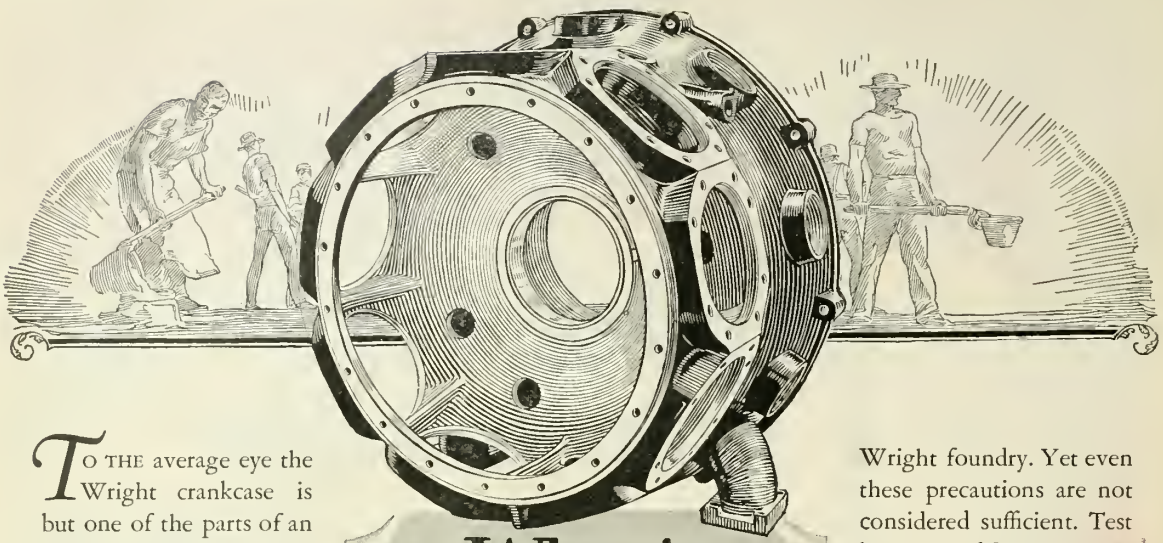
Bohnalite, the latest process light alloy is playing an important part in aircraft motor construction. Its great lightness and great strength are vital features in aircraft pistons, cylinder heads, crankcases, etc.

As we are constantly experimenting with the foremost aeronautical engineers, it is possible that Bohn engineers and Bohn metallurgists may be of service to you in connection with some of your motor problems.

Investigate Bohnalite—the advanced light alloy.

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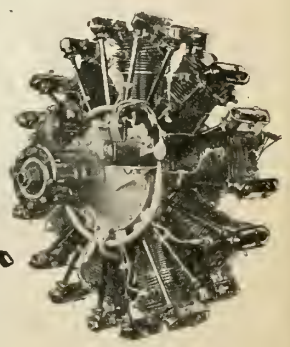
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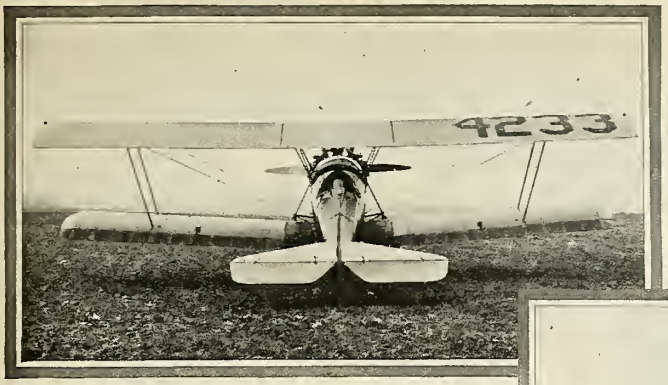
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Speed—318.69 m. p. h.
Altitude—38,793 feet

FOR the second time within five months the new Champion Aviation Spark Plug has helped to establish a new world's speed record.

Major Mario De Bernardi, Italian ace, on March 30th broke his own existing world's record in a Champion equipped Macchi-Fiat plane, with a speed of 318.69 miles per hour.

Designed to withstand the extremes of service in aviation, the new Champion Aviation Spark Plug has already established new high standards of spark plug performance in aircraft engines.

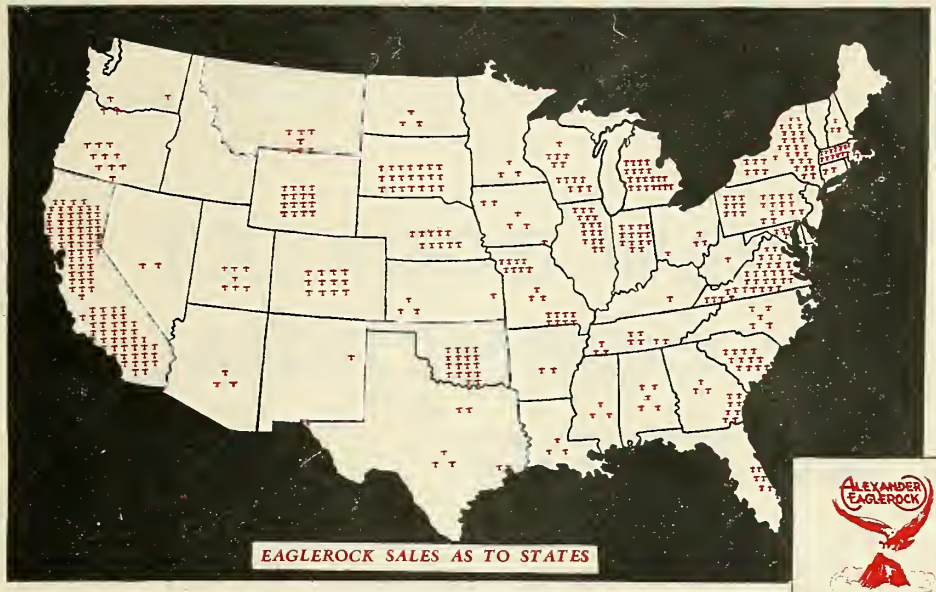
Two world's speed records in quick succession and a new world's altitude record made by another Italian flyer, Renato Donati, with a height of 38,793 feet in a Romeo Jupiter motored plane give eloquent testimony of the new Champion Aviation Spark Plug.

The Champion Aviation Spark Plug was developed with the vast experience and unusual resources of Champion's engineering staff, dedicated exclusively to spark plug manufacture. It embodies all the excellence in material and manufacture exclusive to all Champion Spark Plugs.

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The booklet is intended for general distribution and contains material of interest both to the layman and to those who make aviation their livelihood. It will be mailed to you, without cost, upon your request. In writing for it, please use your own letterhead and address your request to

THE STOUT METAL AIRPLANE COMPANY

Division of

FORD MOTOR COMPANY

Dearborn, Michigan

Volume 12
No. 6

AERO

JUNE
1928

THE MAGAZINE OF THE AIR

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International photo.

A group of Keystone Bombers in Army flight maneuvers

AIR—HOT AND OTHERWISE

Good News!
Out of the West—
More Good News!!
Dredging

By Frank A. Tichenor

AND now we know what Lindbergh's going to do. As technical head of Transcontinental Air Transport, Inc., which will establish a forty-eight hour air-rail passenger service between Los Angeles and New York City, he will continue to be the world's greatest pioneer of aerial development.

No statement has been made as to what salary will be paid to this young man who, without even being interested for a moment, refused extravagant offers, fortunes a month, from all sorts of sensationalists anxious to capitalize the glory of his great achievement of a year ago, so that they could reap its unearned increment. Lindbergh has done exactly what might have been expected of a youth of his great common sense and worth while intellectual farsightedness. He did not fly the ocean as a stunt. He flew it as an object lesson to mankind. He knew what a plane could do, he knew the kind of plane it had to be to do it, he raised the money for the building of that plane and then alone, unhampered by the possibility of any failing partner, he went ahead and DID it.

Now, as technical chief of Transcontinental Air Transport, Inc., he will be one of the chief instrumentalities in the establishment of a forty-eight hour air-rail passenger service from Atlantic to Pacific. It is the logical and admirable thing for him to do. It gives the nation another splendid gift from the hands of energetic youth. This service will reduce the time of travel across this mighty continent by much more than half. It will speed up American business, life in general. It will shrink the size of North America and thus make it easier to operate this mighty nation as a concern 100 per cent going. It will give all its citizenship, to a degree not known before, the benefit of the constructive effort of each citizen. Forty-eight hour transit from one coast to the other will once more revolutionize our national life upward.

The nation owes another debt to Lindbergh. It will pay it.

Hooked up with C. M. Keys, president of Transcontinental Transport, Inc., he will have the right associations from the top all the way down. Keys surrounds himself with others who are genuine. Congratulations are due first, perhaps, to Transcontinental Air Transport, Inc., but we are justified in offering them to Lindbergh, too. Most of all we are convinced that they are coming to the people of the nation and, among that mass, ourselves. AERO DIGEST, reading this great piece of news, feels as if the world had given it a gift. It ought to. That's what has happened. That this gift is shared by every citizen of the United States, the nation in which this splendid combination will speed up and benefit existence as a whole, is its very finest detail.

This announcement of the Transcontinental Air Transport, Inc., the air-rail system which will cut the general passenger transport time between the Atlantic and Pacific coasts to less than forty-eight hours, tapping nearly every principal city in the country on its route, was an epochal event. Co-operation between the Pennsy and the Atchison in this intelligent hook up with air transport is heartening, inspiring.

The interest of the railways in aviation is becoming notable, quite as it should. When Clarence Chamberlin spoke at the dinner of the Railway Executives, at the Hotel Commodore, New York, during the past winter, he told them that we needed their help. He said truly that we of the air interests would welcome their entrance into our ranks if they wanted to come in and be friends.

But he added (and Clarence can use emphasis when he thinks well of the idea) that if they didn't join us we would go ahead just the same, peacefully and quietly. If the railways thought it wise to fight air transport as a rival, they would find in us of the air interests willing participants in any kind of shindy they might start.

Chamberlin knew the facts and stated them. It is now evident that the railways realize that, too. That is good news for us and for the country and is good judgment on the part of the railway men.

The sponsors of the new rail-air system believe that nothing other than their plan with its distinguished personnel could so convince the general public of the fact that air transport is here in a very serious way. I believe that thought is right. It's a great lineup of brains, manpower and machines. Read the list, and glory in it.

General W. W. Atterbury, president of the Pennsylvania Railway; C. M. Keys, of the Curtiss Company; William May Good; Harold Bixby, president of the Chamber of Commerce of St. Louis; Richard Hoyt, of Hayden Stone and Company; Harry B. Knight; Fred Harvey, of Kansas City—*and Colonel Charles A. Lindbergh!* These are names to conjure with!

Watch us grow, this year! Before the twelvemonth passes the above will be one of the small achievements, by comparison with others, which will have come to pass.

CAME Major C. C. Moseley, Harris M. Hanshue and "Jim" Woolley out of the West, three musketeers of air transport, in other words the personnel of Western Air Express.

Back in 'Forty-nine the pioneers started from the East and labored slowly, often amidst astounding dangers, to reach the West, then an unknown, mysterious country.

Ox-carts were their usual vehicles and the speed of ox-carts is whatever it may be, but never more, perhaps, than two or three miles an hour. Today the airplane is the vehicle of such men as I have mentioned, who came from the West to East, and their speed was in excess of 100 miles an hour.

The West-bound venturers had Indians to fight along the way. The East-bound pilgrims looked down (if they chanced to think of it) on those old battlefields and found them wholly peaceful. They looked down on them even as the eagle peered at them from the high clouds three-quarters of a century ago.

These men came out of the West to take back with them three new tri-motored transports, Pratt and Whitney Wasp motored Fokker monoplanes, to inaugurate a regular air-passenger service between Los Angeles and San Francisco.

In 'Forty-nine that journey was a horror to those in the covered wagon and those who walked on foot beside it. Only the man on horseback could make it with fair comfort and even to that man it was a real ordeal!

Now it will be made in the new vehicle of these modern transport men without need of worry over the tremendous mountain peaks, or rock- *(Continued on page 1042)*

THE HUMAN EQUATION IN THE AIR CORPS

as related to its claim for a separate promotion list

BY RALPH W. CRAM

THE romance and the tragedy of service in the United States Air Corps were strikingly revealed, it seems to this writer, when Lieut. Lester J. Maitland told the House Committee on Military Affairs "he has been a lieutenant in the Air Corps since 1918, that he has been 'over 10 years on a flying status,' and that according to the present list he is 'due for promotion to a captaincy in July, 1932, and to a majority in 1948, after 31 years of service.'"



Lt. Lester J. Maitland



Lt. A. F. Hegenberger

The quotation is from the favorable report on the Furlow bill (H. R. 12814) made for the committee by Congressman Wainwright, and committed to the Committee of the Whole House on the state of the Union. Certainly those who are in favor of the Air Corps sons for the claims for a separate promotion list provided for in this bill, will hope that at last it is to find a clear path to its passage by Congress and enactment into law.



Lt. R. L. Maughan

Lieut. Maitland was not singled out for special mention by the Committee. It also quoted his co-pilot on the Hawaiian flight, Lieut. A. F. Hegenberger, who was also the navigator and radio operator of the big army transport on this historic flight, as stating before the Committee that "he would not be a major until he was 53 years of age, at the present rate of promotion."



Capt. St. Clair Streett



Lt. E. C. Batten

Here we have two illustrations of the personal and human argument for a separate Air Corps promotion list which has always appealed to me during ten years of pleasant and of more-or-less intimate relations with many fliers. Having during that period done enough flying to understand their problems and talk their language, as well as appreciate their fine loyalty to the service, it seems to me that this is the most appealing argument that can be put forward. Anyone who has been carefully observing the development of aviation since World War days, and even earlier, must have seen the cumulative force of events that substantiate the fliers' claim that, when an Air Corps member dies in line of duty, promotion on account of the vacancy created ought to go to another member of the Corps.



Lt. Clifford C. Nutt



Lt. Clayton Bissell



Lt. Eric Nelson



Lt. C. E. Crumrine

As Colonel Charles A. Lindbergh put it in testifying before the Committee: "If a flying officer meets his death, the vacancy should be filled by an Air Corps officer of equal experience."

That has not been the rule, as is quite generally known; such casualties in line of duty in the Air Corps usually led to promotions in quite unrelated lines of Army service, the Committee's report stating that while the strength of the Air Corps was but one-twelfth of that of the Army, 40 per cent of the deaths on the Army's active list occur in the Air Corps. No wonder it says the effect on the morale of the Air Corps is bad.



Lt. J. H. Doolittle



Lt. Lowell H. Smith

Let's look at a number of individual cases showing what has been the effect of the single promotion list.

Lieut. Maitland, who has already been referred to, is one of many Air Corps officers who have performed services of especial distinction, and who still hold the same rank that they did when they entered upon their careers of brilliant and hazardous service. He was a lieutenant when he finished second in that—in my opinion—most thrilling of all the races for the Pulitzer Trophy, at Detroit in 1922. In the following March he established a new world's speed record of 239 miles an hour. Later he was the officer designated to place the Model Airways in operation and was the Control Officer of that activity for a number of years. June 28, 1927, he was first, with Lieut. Hegenberger, to fly from our west coast to Hawaii. He is now on duty as assistant executive in the offices of the Assistant Secretary of War for Air. But—he is still a first lieutenant.



Capt. F. O'D. Hunter

Lieut. Hegenberger, according to the Military Affairs Committee report, "has been a lieutenant in the Air Corps since the World War and has held positions of great trust and responsibility." But he is still only a lieutenant.

Who won that Pulitzer race in 1922? Lieut. Russell L. Maughan won that sensational contest at the then almost unknown speed, around a closed course, of 205 miles an hour. He also won the opportunity of making, in the same plane, his famous Dawn-to-Dusk Flight from New York to San Francisco on June 23, 1924, a distance of 2,540 miles, in 21 hours, 48½ minutes flying time. He also is still a first lieutenant.



Lt. A. G. Hamilton



Capt. A. W. Stevens

Great races, those Pulitzer Cup events. It has been my privilege to see them all. Their influence on the development of fast airplanes and efficient motors is be-

yond estimate; but those who took part in them always—though eagerly—assumed unusual hazards for the good of the service. At Dayton, in 1924, we saw Captain Burt E. Skeel's plane crumple in the air as he dove from a great height at the start, and another gallant flier was gone.

Lieut. Alexander Pearson made an aerial survey of the Grand Canyon of Arizona, June 10, 1921. He was one of the outstanding pilots in the Air Corps when he was killed while practicing for that same Pulitzer race at Dayton, and he died a lieutenant.


Major H. A. Dargue


Capt. Ira C. Eaker

Captain St. Clair Streett commanded the New York-Alaska flight during July-October, 1920. The Four Army DH-4s left Mitchel Field, Long Island, New York, July 15, and arrived at Nome, Alaska, August 25. The return trip started August 29 and was successfully completed October 20, 1920. Flying over very difficult terrain for about 9,000 miles, Captain Streett took his formation over glaciers, forests and uninhabited regions, without damage to flier or plane. In common with officers of other branches as well as the Air Corps, he was reduced in rank to a first lieutenant November 18, 1922, as a result of the reduction of the entire Army. He was member of the board of officers which planned the Round-the-World Flight, still as a first lieutenant. He reached the grade of captain again in the year 1927.


Capt. A. B. McDaniel

Of the other commissioned officers on that Alaskan flight, Lieut. Clifford C. Nutt was second in command. He served very valuably as Advance Officer for the Round-the-World Flight. But he is still a lieutenant.


Lt. Muir S. Fairchild

Lieut. Eric Nelson was on that Alaskan Flight, and later on the Round-the-World Flight. He was its Engineer Officer, as he was on the Porto Rican Flight. He is still a first lieutenant.

So is Lieut. C. E. Crumrine, of the Alaskan Flight and one of the Advance Officers of the Round-the-World Flight.


Lt. Ennis C. Whitehead

No one who was listing the outstanding pilots of the world would fail to place Lieut. James H. Doolittle near the top. His contributions to the advancement of aviation have been very practical and noteworthy. In 1922, in company with Leland S. Andrews, he flew from San Antonio, Texas, to Rockwell Field, Calif., in 13 hours 25 minutes, which was a record at that time. The following September, flying a rebuilt DeHavilland plane which was very heavily loaded, he made a transcontinental flight from Jacksonville, Fla., to San Diego, Calif., in the elapsed time of 22 hours 35 minutes. He stopped at Kelly Field, Texas, over an hour to refuel. Considering the equipment and instruments available at that time, it is recognized as a remarkable flight. Lieut. Doolittle won the Schneider Cup in 1925. He is the first officer to have ever made an outside loop in a plane, a feat which prior to this time was considered a physical impossibility with the equipment, as well as prohibited by the terrific strain on the pilot. It has since been duplicated by Lieut. Al Williams of the Navy. Lieut. Doolittle has twice visited South America, on furlough, as flying representative of the Curtiss Aeroplane Co., and in 1926 was the first officer to fly across the Andes Mountains. He is still a first lieutenant.


Lt. L. D. Weddington


Lt. B. S. Thompson

It was Lieut. Lowell H. Smith, designated as second in command of the Round-the-World Flight, who assumed command when the commander crashed in the first part of the trip, and brought the flight to a successful conclusion. He first came into prominence August 27-28, 1923, when in company with Lieut. J. P. Richter, he established the world's endurance flight record of 37 hours, 15¼ minutes. During this flight he circled in the vicinity of San Diego and refueled his plane while in flight. He now has the rank of captain in the Army Air Corps.


Lt. C. McK. Robinson


Lt. John A. Macready

Captain Frank O'D. Hunter is representative of a special class of fliers, having remained in the pursuit group of the Air Corps since the World War. He is considered one of the Corps' most pursuit pilots. He was the recipient of the D. S. C. with four oak leaves and the Croix de Guerre with palm. Captain Hunter has been forced to jump in a parachute on two occasions, giving him a double membership in the famous Caterpillar Club, but it has not deterred in the slightest his desire for flying. He is still a very active pilot.


Lt. Burdette S. Wright


Lt. Harold R. Harris


Lt. Corliss C. Moseley

Some three years ago the newspapers told of Lieut. E. C. Batten's feat of completing a six weeks' photographic tour along the Canadian border, photographing about 2,000 square miles of the international boundary in weather varying from 10 to 17 degrees below zero. He is still a lieutenant, on duty at McCook Field as test pilot—that most demanding of all flying jobs, taking into the air planes, often experimental, that no one else has flown.

Night flying was uncommon when Lieut. Clayton Bissell made the first round trip night flight from Bolling Field, Washington, to Langley Field, Virginia, June 16, 1922. He is still a lieutenant, a pursuit instructor in the Air Corps Tactical School at Langley. Lieut. A. G. Hamilton made a service test parachute jump from an altitude of 20,900 feet on August 21, 1920, requiring only 12 minutes to descend. The following year, at Rantoul, he jumped from 23,000 feet.


Lt. Leigh Wade


Lt. John Harding

Captain A. W. Stevens made a parachute test jump from an altitude of 24,206 feet at McCook Field, June 12, 1922. He was the *(Continued on page 1050)*

AVIGATION EQUIPMENT

By

Lieutenant Commander P. V. H. Weems, U.S.N.

The Navy Department recently detailed Lieutenant Commander Weems to instruct Colonel Lindbergh in navigation.

A COMPLETE list of the items of equipment for avigation would be as follows:

1—Sextant, bubble type. 2—Chronometer watch. 3—Nautical Almanac. Extracts for the date used will suffice. 4—Charts, chart board, and either parallel rulers or a drafting machine. A drafting machine is handier. 5—Chosen method of working the line of position. The latest method is that given in the Line of Position book which is meeting the approval of the avigators who have tried it. 6—Dividers, pencil and work book.

The writer has used a Bureau of Standards Navy sextant for several months, during which time he has taken several hundred observations. Without a doubt this sextant is a great improvement over the old style sextant where a spirit level was attached to an ordinary sextant. In the old style sextant with bubble attachment, it is necessary to bring the body, the bubble and the bubble marks together. This means that three objects must be viewed simultaneously. With the Bureau of Standards sextant, it is necessary only to bring the observed body to the center of the bubble, when the latter is approximately at the center of the field. This operation can be done so easily that at first one is inclined to consider the method crude. As a matter of fact, results using this sextant are surprisingly close. Lincoln Ellsworth, on first trying out this sextant made the observation, "It certainly looks crude to give such accurate results." This sizes up the matter perfectly.

Another feature of the Bureau of Standards sextant which is especially good for night work is the fact that a star may be viewed directly through a plain glass making the star almost as easy to pick up as it is to see it with the naked eye. The bubble is illuminated by a small electric light controlled by a rheostat. When observing the sun, the bubble is viewed directly while the sun is reflected.

The sextant is handy to operate, is light and compact, and is easy to read. There is a small reading light for night work. Discouraging features about the Bureau of Standards sextant are the difficulty of keeping the small lights in order, trouble with lost motion, and the fact that it takes considerable time to make radical changes of angle setting. Also, the dimmer glass bracket in certain positions catches on the reflecting plate which throws the sextant out of adjustment. If instructions were implicitly followed, this would not happen, but it is highly desirable to have the instrument more nearly fool-proof, since more or less inexperienced persons will have to use sextants in the air. Altogether, the Bureau of Standards sextant, while expensive and while defective in minor details, is a highly satisfactory instrument and a great improvement over the old style sextant with bubble attachment.

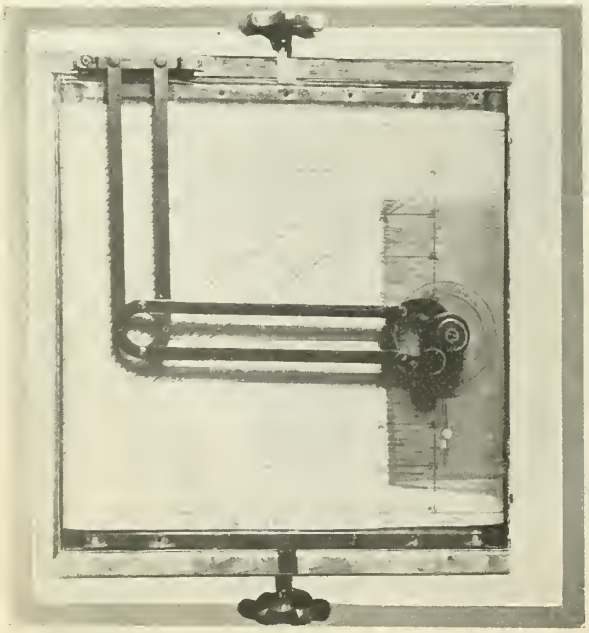
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ERROR	2 A	3.5 T	1 A	1 T	1 T	0

SAME AS FOR NO 1

Sample sights worked by the Line of Position book

Using second setting watch set to G.A.T. for the EQ.T. of local noon, and showing simplified form for navigation.
Note: The watch face for GR.P.M. is the F.H.A. but 12 hours and EQ.T. are added to get the GCT for picking out Dec. If sights are not taken in close succession the same work as for No. 1 sight will be required in this case. The values for terms LHA to Hc are the same for each sight and need not be repeated.

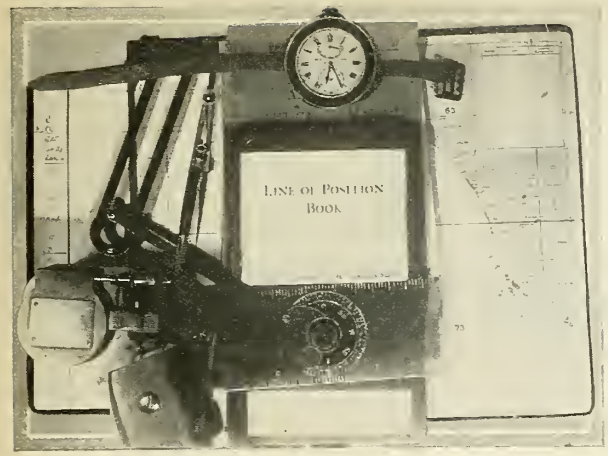
Average errors of 6 sights...¼ miles Total time for 6 sights.....14 min.
Error for 6 sights averaged..0.4 miles Average time per sight..2 min. 20 sec.
Used Bureau of Standards Sextant and U. S. N. Hamilton Chronometer Watch as altered by J. Jessop & Sons.
True position of observer: L32—42N Lo117—11N.



Two-star altitude curves as used in a strip map cabinent

By moving the bottom scale till it registers with the proper vertical line etched on transparent cover, both latitude and longitude are given by the intersection of the curves.

Thanks to the fact that watch manufacturers can make a watch for a reasonable sum and guarantee it not to vary in rate more than one or two seconds per day, our problem as regards time may be worked accurately. When it is considered that a chronometer watch which varies in rate more than two seconds per day, when there are 86,400 seconds in a day, the fact considered as an engineering feat is nothing short of marvelous. So far as can be detected.



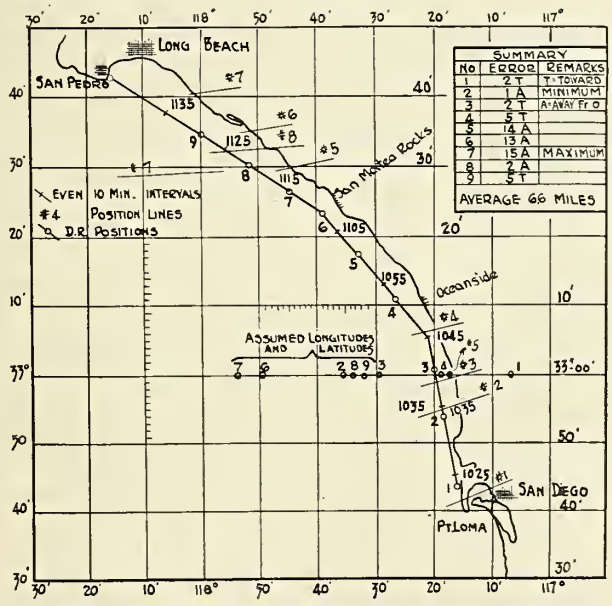
Complete outfit for avigation; weight about 5 pounds

a sidereal watch which has been used in the air and on the ground as an ordinary watch would be used has not changed its rate during several months it has been tested. The avigator needs two watches, one set to Greenwich apparent time for work with the sun, and one set to Greenwich sidereal time for work with the moon, stars and planets. Thanks to the daily radio ticks, it is now a simple matter to check and rate watches. Since the correct time to the second can be obtained as often as needed, there is no longer the necessity for keeping three chronometers carefully checked at every opportunity and compared daily. It might be desirable to have such instruments aboard ships which might be at sea and out of radio range of time signals, but it certainly is not needed to give the correct time to avigators, and for navigators of small craft.

With the invention of the second setting watch, the exact second time as closely as the rate of the time piece permits, can now be kept continuously, and since this rate should certainly not vary more than two seconds per day (watches must not vary in rate more than this amount to pass railroad inspection), we might safely claim to have the correct time within a second, if we get the daily radio ticks and set the watch to the exact second of time.

The Nautical Almanac gives a considerable amount of information which is not needed by the avigator. If desired, a few pages can be copied or taken from the Nautical Almanac which will suffice for all purposes for the avigator. However, the complete Nautical Almanac is a pamphlet of only 168 pages, or about one quarter of an inch in thickness.

There are numerous methods by which the line of position may be worked. One which would otherwise be useful in the air is so unhandy that it is shunned by the average airman. The monumental tables, H. O. 203 and H. O. 204, are referred to. They are being widely used by seagoing vessels. In addition to their bulkiness, they have the serious disadvantage of not being accurate within an hour of the meridian. For the navigator, this is not such a serious handicap, but for the avigator travelling at 100 miles per hour it might cause serious trouble. Due to length of time necessary for solution, and chances of errors with complicated logarithms, the old time sight and standard cosine-haversine method may be considered impracticable for the avigator. While Bygrave's slide rule has the advantage of speed and sufficient accuracy, the vibration of the plane causes trouble in its operation and at the same time does not leave a complete record of the computations. Aquino's method has many advantages and will appeal to many, then there are various graphical solutions. The method we advocate as requiring one standard solution for all cases, and as the easiest and most compact, is that based on Ogura's altitude tables combined with Rust's Azimuth Diagram. With the kind permission of Ogura and Rust, the Naval Institute has published these two methods (one for finding altitude, and one for azimuth) in one book, the Line of Position book. Auxiliary tables made up especially for the avigator are included, yet the book has only 44 pages and can be carried in the coat pocket. It requires no interpolation and is accurate under all conditions for which it is used, the slight inaccuracy when the body nears the zenith not being considered, as a sight would be difficult or impossible to get at the instant the body is in the zenith.



Sun lines worked and plotted in Navy mail plane, San Diego to San Pedro, Nov. 28, 1927. Distance 90 miles; time 90 minutes

While a drafting machine is not absolutely required, it is a most convenient thing to have both for dead reckoning as well as for avigation by celestial bodies. A drafting machine with six-inch arms, mounted on a light 12 by 14-inch board makes a good combination. The chart board should be covered with transparent celluloid for protection.

SAN DIEGO TO SAN PEDRO VIA MAIL PLANE Nov. 28, 1927
(copied from work book)

FORM	1023 SUN	1033 SUN	1040 SUN	1052 SUN	1100 SUN	1106 SUN	1114 SUN	1129 SUN	1121 SUN
C	6-23-48	6-33-45	6-41-18	6-52-30	7-00-30	7-06-4	7-14-58	7-29-30	7-21-38
COR(CC LEC)	+12-37	+12-37	+12-37	+12-37	+12-37	+12-37	+12-37	+12-37	+12-37
G.A.T.	18-36-25	18-46-22	18-53-55	19-05-07	19-13-07	19-19-18	19-27-35	19-42-07	19-34-15
G.H.A.	99°06'3	101-35.5	103-28.8	106-16.8	108-16.8	109-49.5	111-53.8	115-31.8	113-33.8
LONG AS	117-06.3	117-35.5	117-28.8	117-16.8	117-16.8	117-49.5	117-53.8	117-31.8	117-33.8
L.H.A.	18°E	16°E	14°E	11°E	9°E	8°E	6°E	2°E	4°E
LAT.	33°N	33°N	33°N	33°N	33°E	33°N	33°N	33°N	33°N
DEC.	21-14.1 S	21-14.2 S	21-14.3 S	21-14.4 S	21-14.5 S	21-14.5 S	21-14.5 S	21-14.6 S	21-14.5 S
K	34-19.6 N	34-02.5	33-47.8 N	23-29.0 N	33-19.3 N	33-15.4 N	33-08.6 N	33-06.0 N	33-03.8 N
K~d	55-33.7	55-16.7	55-02.1	54-43	54-34	54-30	54-23	54-16	54-18.3
A	1510	1193	913	563	377	298	168	19	74
B	24761	24449	24177	23836	23676	23605	23481	23358	23393
LOG Hc	26271	25642	25090	24399	24053	23903	23649	23377	23467
Hc	33-06	33-39	34-08	34-46	35-05	35-13	35-28	35-43	35-38
Ho	33-20	33-48	34-11	34-39	34-31	34-48	34-47	35-13	35-07
Q	14'T	9'T	3'T	7'A	34'T	35'A	41'A	30'A	31'A
Z	S 23°E	S 18°E	S 15°E	S 13°E	S 11°E	S 9°E	S 7°E	S 2°E	S 5°E
	1	2	3	4	5	6	7	9	8

Average error: 6.6 miles. Equipment: Bureau of Standard's Sextant, GCT watch, Line of Position book, chart, drafting machine and board, work book, dividers, pencil, extract NA.



A formation of Army bombing planes swooping down over Langley Field, Virginia *International photo.*

AERIAL "WAR" AT LANGLEY FIELD

By Charles McLean

NINETY great craft of the skies, each armed to the teeth with ammunition and bombs, swooped down from the sky over historical Virginia near Langley Field, on the afternoon of May 4th.

A Pursuit Squadron of twenty-five Curtiss "Hawks," flew down from Selfridge Field, Mt. Clemens, Michigan.

An Attack Squadron of twenty-three new Curtiss attack planes came up from Texas. This was the initial appearance in large scale army air operations of the new attack plane, which is equipped with six machine guns and can carry 250 pounds of bombs in addition to 2,600 pounds of machine gun ammunition. When engaged in battle these attack planes skim about 100 feet above the surface of the ground at better than 125 miles per hour. They rely for their safety solely on their speed and the suddenness of their attack. Two guns are installed in the wings, two fire through the propeller, these four guns being operated by the pilot. The two remaining guns are handled by the gunner in the rear cockpit.

A squadron of 12 Keystone "Pirates," of the Second Bombardment Group, Langley Field, participated. Eighteen more bombers, seven observation and fifteen transport planes also took part in the mimic war.

The fury unleashed during a few minutes' demonstration, had those same planes been directed against the entire Naval fleet, would have wreaked havoc and destruction that would have been irreparable.

But it was only a "joke" attack, so the only actual casualties were the "synthetic" troops which the enlisted men of Langley Field had arranged for the maneuvers, and acres and acres of black Virginia soil, around Messick Creek.

The Army Air Corps were demonstrating the effectiveness of pursuit and attack planes operating against infantry, artillery and cavalry under simulated war conditions.

Assistant Secretary of War, F. Trubee Davison, and Major General James E. Fechet, Chief of the Army Air Corps, who, above everything else have the interests of the Air Corps in their minds constantly, arranged these startling maneuvers as the most effective means of demonstrating to the high government officials and other observers the practical value of our country's aerial defense.

The demonstrations were under the command of Brigadier-General Benjamin D. Foulois, Assistant Chief of Air Corps, whose staff was headed by Major Carl Spatz.

Forty veteran members of Congress, who had been invited to witness the demonstrations, blinked their eyes in amazement, at the same time holding their ears to prevent the deafening boo-omb! of the great bombs. In between spouting geysers of black earth, thrown hundreds of feet into the air by the bombs, there came, almost weakly, the punitive rat-tat-tat of machine gun fire.

"Could this be an actuality?" these members, headed by that friend of aviation, Representative Frank James, of Michigan, asked themselves.

On their faces one could read their thoughts: "God help

(Continued on page 1056)



Army officials and Congressmen, headed by Representative Frank James (6th from right), witness air maneuvers *P. & A. photo.*

UNIFORM STATE REGULATION NEEDED

By
Clarence M. Young
Director of Aeronautics, Department of Commerce

THE Department of Commerce, being a Federal agency, now has control only over interstate flying so far as licensing is concerned. While it is empowered to, and does, require that all aircraft carry identification numbers whether or not they are engaged in interstate commerce, it cannot establish minimum requirements for airworthiness in aircraft operating solely within one State. As a result, airplanes that are condemned by the Department Inspectors and refused licenses for interstate commercial use may obtain identification numbers and operate solely within their own State, carrying passengers or property for hire.

This situation has to some extent been altered by legislative action of the various State legislatures, but until there is concerted uniform action by all the States, effective regulation of all aircraft is impossible. And, since the layman will not consider the airplane a really safe means of transportation until regulation is general and accidents are reduced in number, action must be taken, and that as soon as possible, to eliminate the condemned or unairworthy airplane completely.

The salient characteristic of the airplane is its ability to annihilate distance. Therefore the States which have not had foresight enough to pass adequate and uniform legislation will find the unairworthy and unsafe aircraft moving into their States like the movement of the seventeen-year locust, which may occasion loss of life and damage to property through inadequate control.

The latest step in the right direction has been taken by the States of New York and New Jersey, which have recently enacted legislation requiring all planes and all pilots operating within the State to obtain a license issued by the Department of Commerce, if the operation is such as would require a license if the same were interstate. Such a requirement entails no additional expense to the State passing such legislation, as would be attendant should a State license be required. A State license would necessitate the set-up of a State inspection force, which may duplicate the work already performed by this Department.

Through the agency of the Approved Type Certificate now issued to manufacturers, practically all new planes produced will be licensed immediately upon purchase from the factory, and in the course of time there will be no necessity for State inspection if the States will require a Federal license. The problem immediately confronting the authorities today is the class of plane which cannot be licensed due either to its present deterioration or by reason of no technical data being on file in the Department. It might easily be the case that certain States might license planes which through a cursory examination might appear to be airworthy, but due to no technical data being available would not meet the requirements of the Federal government regarding factors of safety. Accidents to aircraft in this category could easily defeat the purposes of State legislation, which does not require a Federal license.

Aircraft before being licensed by the Department of Commerce is required to meet not only the standards prescribed for material and workmanship, but the Department must also be satisfied that the aircraft is safe from an aerodynamical standpoint.

The personal equation is always bound to enter into the question such as is confronting us today. Therefore it is believed more advantageous to all concerned if the manufacturers, operators, pilots and mechanics have only to deal with one agency. From the standpoint of the operator, there is the final proposition involved; namely, the requirement of a Federal license should the operator desire to move his base of commercial operation from one State to another. In other words, even though a barnstormer in the State of Maryland has obtained a Maryland license, if such is required, and moves to the State of Delaware, there continuing his operation of carrying passengers or property for hire only within that State, it would be necessary that he obtain a Federal license if his plane is flown from the State of Maryland to the State of Delaware, even though no passengers or property are carried on this trip. Thus it can be seen that even though he obtains a State license in the first instance, eventually by reason of the unlimited scope of operation of aircraft, it would be necessary that he obtain a Federal license in order to realize on his investment.

There was an announcement published in the papers within the last few days to the effect that a combination transcontinental transportation company would begin operations in the near future, partly by airplane and partly by railroad. It is within the realm of possibility that shorter hauls may eventuate, the airplane part of the transportation taking place wholly within one State. Such a State may require a State license for such flight, but due to the fact that the passenger would change to the train continuing his interstate journey, the plane and pilot would be required to obtain a Federal license in accordance with the Air Commerce Act of 1926 by reason of the flight being part of a through-carriage between States. This is an example of the duplicity of inspection and examination of the aircraft and pilot with its attendant costs to the State by reason of the additional set-up of a State inspection service to carry out its duties as required by such a type of State legislation.

Another example similar to the above is in the case where feeder lines, if either passengers or cargo are carried for hire, are operated wholly within the State delivering such passengers or cargo to the railroad or steamship. That part of the flight taking place wholly within the State requiring a State license, the plane and pilot would be required to obtain a Federal license, such operation being a part of a through-carriage between States.

Congress during this transitory stage of commercial aeronautics did not see fit to give the Federal government jurisdiction over all planes and pilots in respect to licenses, but in its wisdom did see fit to extend jurisdiction over all flights by providing that the Secretary of Commerce shall by regulation establish air traffic rules for the navigation, protection, and identification of aircraft including rules as to safe altitudes of flight and rules for the prevention of collisions between vessels and aircraft. Such air traffic rules have been promulgated requiring aircraft to maintain certain altitudes over congested areas, prohibiting acrobatics with passengers for hire, and over prohibited areas, establishing take-off, landing, and overtaking rules, thus endeavoring to minimize any hazard attendant upon aircraft flight, both to those in the air and those on the ground beneath. Congress may see fit to extend the jurisdiction of the Department in regard to licenses for all aircraft, thus it can

(Continued on page 1048)

ABSTRACT OF STATE LAWS ON AERONAUTICS

As of March 15, 1928

TYPES OF STATE AERONAUTIC LAWS

STATE aeronautic legislation has been of two types regulatory laws providing for licensing of airmen and aircraft, air traffic rules, etc., and nonregulatory laws, such as the uniform State law, the purpose of which is to establish the legal status of air navigation in relation to general law.

The District of Columbia law, being regulatory in character, and the regulatory provisions of the Hawaii law, were superseded by the Federal Air Commerce Act of 1926. The California and Florida laws became void under express provisions that they would be in effect only until Federal legislation entered the field. Regulatory provisions of other State laws are superseded by the Federal Air Commerce Act of 1926 in so far as they are inconsistent with it.

In the following States there is no State aeronautical legislation: Alabama, Arizona, Georgia, Illinois, Indiana, Iowa, Mississippi, Missouri, Montana, Nebraska, New Hampshire, New Mexico, New York*, North Carolina, Ohio, Oklahoma, Rhode Island, South Carolina, Texas, Virginia, Washington, West Virginia.

UNIFORM STATE LAW

A "Uniform State Law of Aeronautics" has been adopted and is still in force in the following States and Territories. In Michigan the uniform State law has been supplemented by regulatory legislation. The regulatory provisions added to the uniform State law as adopted in Hawaii were superseded by the Federal Air Commerce Act of 1926.

Delaware, 1923 (ch. 199, approved Mar. 23, 1923).
Hawaii, 1923 (Revised Laws of Hawaii, 1925, secs. 3894-3905).
Idaho, 1925 (ch. 92, approved Feb. 25, 1925).
Maryland, 1927 (ch. 687, approved Apr. 26, 1927).
Michigan, 1923 (ch. 224, approved May 23, 1923).
Nevada, 1923 (ch. 66, approved Mar. 5, 1923).
North Dakota, 1923 (ch. 1, approved Feb. 5, 1923).
South Dakota, 1925 (ch. 6, approved Feb. 24, 1925).
Tennessee, 1923 (ch. 30, approved Feb. 16, 1923).
Utah, 1923 (ch. 24, approved Feb. 28, 1923).
Vermont, 1923 (ch. 155, approved Mar. 26, 1923).

TEXT OF UNIFORM STATE LAW

AN ACT CONCERNING AERONAUTICS AND TO MAKE UNIFORM THE LAW WITH REFERENCE THERETO

Be it enacted—

SECTION 1. [Definition of terms.] In this Act "aircraft" includes balloon, airplane, hydroplane,[1] and every other vehicle used for navigation through the air. A hydroplane, while at rest on water and while being operated on or immediately above water, shall be governed by the rules regarding water navigation; while being operated through the air otherwise than immediately above water, it shall be treated as an aircraft.

"Aeronaut"[1] includes aviator, pilot, balloonist, and every other person having any part in the operation of aircraft while in flight.

"Passenger" includes any person riding in an aircraft but having no part in its operation.

SEC. 2. [Sovereignty in space.] Sovereignty in the space above the lands and waters of this State is declared to rest in the State, except where granted to and assumed by the United States pursuant to a constitutional grant from the people of this State.

NOTE.—Hawaii substitutes "Territory" for "State." Both Hawaii and Michigan omit the words "pursuant to a constitutional grant from the people of the State."

SEC. 3. [Ownership of space.] The ownership of the space above the lands and waters of this State is declared to be vested in the several owners of the surface beneath, subject to the right of flight described in section 4.

NOTE.—Idaho omits the words "subject to the right of flight described in section 4"; deleted on amendment.

SEC. 4. [Lawfulness of flight.] Flight in aircraft over the lands and waters of this State is lawful, unless at such a low altitude as to interfere with the then existing use to which the land or water, or the space over the land or water, is put by the owner, or unless so conducted as to be imminently dangerous to persons or property lawfully on the land or water beneath. The landing of an aircraft on the lands or waters of another, without his consent, is unlawful, except in the case of a forced landing. For damages caused by a forced landing, however, the owner or lessee of the aircraft or the aeronaut shall be liable as provided in section 5.

NOTE.—Utah adds "or damaging" after the word "dangerous."

SEC. 5. [Damage on land.] The owner of every aircraft which is operated over the lands or waters of this State is absolutely liable for injuries to persons or property on the land or water beneath, caused by the ascent, descent, or flight of the aircraft, or the dropping or falling of any object therefrom, whether such owner was negligent or not, unless the injury is caused in whole or in part by the negligence of the person injured, or of the owner or bailee of the property injured. If the aircraft is leased at the time of the injury to person or property, both owner and lessee shall be liable, and they may be sued jointly, or either or both of them may be sued separately. An aeronaut who is not the owner or lessee shall be liable only for the consequences of his own negligence. The injured person, or owner or bailee of the injured property, shall have a lien on the aircraft causing the injury to the extent of the damage caused by the aircraft or objects falling from it.

NOTE.—Utah adds "or damage" after the words "liable for injuries" and after the words "causing the injury." There is also inserted "injury or" after the words "to the extent of the."

SEC. 6. [Collision of aircraft.] The liability of the owner of one aircraft, to the owner of another aircraft, or to aeronauts or passengers on either aircraft, for damages caused by collision on land or in the air shall be determined by the rules of law applicable to torts on land.

SEC. 7. [Jurisdiction over crimes and torts.] All crimes, torts, and other wrongs committed by or against an aeronaut or passenger while in flight over this State shall be governed by the laws of this State; and the question whether damage occasioned by or to an aircraft while in flight over this State constitutes a tort, crime or other wrong by or against the owner of such aircraft shall be determined by the laws of this State.

SEC. 8. [Jurisdiction over contracts.] All contractual and other legal relations entered into by aeronauts or passengers while in flight over this State shall have the same effect as if entered into on the land or water beneath.

SEC. 9. [Dangerous flying a misdemeanor.] Any aeronaut or passenger who, while in flight over a thickly inhabited area or over a public gathering within this State, shall engage in trick or acrobatic flying, or in any acrobatic feat, or shall, except while in landing or taking off, fly at such a low level as to endanger the persons on the surface beneath, or drop any object except loose water or loose sand ballast, shall be guilty of a misdemeanor and punishable by a fine of not more than $500 or imprisonment for not more than 1 year, or both.

NOTE.—Idaho sets the penalty as $100 or 6 months, or both. Maryland sets penalty at $1,000 or 6 months, or both. Nevada makes the imprisonment 6 months. In South Dakota the fine is $1,000 and imprisonment 6 months. Utah adds "loose sheets of paper" after "water" and sets the fine at $300 and the imprisonment 6 months. Vermont's fine is $100. Hawaii adds "or paper handbills" after "ballast" and sets the fine at $1,000.

SEC. 10. [Hunting from aircraft a misdemeanor.] Any aeronaut or passenger who, while in flight within this State, shall intentionally kill or attempt to kill any birds or animals shall be guilty of a misdemeanor and punishable by a fine of not more than ( ) or by imprisonment for not more than ( ), or both.

SEC. 11. [Uniformity of interpretation.] This Act shall be so interpreted and construed as to effectuate its general purpose to make uniform the law of those States which enact it and to harmonize, as far as possible, with Federal laws and regulations on the subject of aeronautics.

NOTE.—Nevada adds at the end of this section: "It shall not be interpreted or construed to apply in any manner to aircraft owned and operated by the Federal Government." Hawaii adds "and Territories" after "States." Michigan omits this section.

SEC. 12. [Short title.] This Act may be cited as the Uniform State Law for Aeronautics.

SEC. 13. [Repeal.] All Acts or parts of Acts which are inconsistent with the provisions of this Act are hereby repealed.

SEC. 14. [Time of taking effect.] This Act shall take effect ( ).

ABSTRACTS OF OTHER STATE LAWS

Acts granting authority to acquire land for airports or other navigation aids and the like have not been included. Neither have there been included local ordinances.

	UNIFORM STATE LAW	ARKANSAS	COLORADO	CONNECTICUT
Authority	No mention	State aircraft board, 3 members	Commission of aeronautics, 3 members.	Commissioner of aviation (sic)[4] and advisory board of 7 members
Aircraft registration and inspection.[3]	do	Annual, on inspection, free; additional inspection, $5.	Board to provide	Annual, on inspection.
Transfer	do	Vendor notifies board; vendee obtains transfer on $1 fee.	No mention	Registration expires on transfer; vendor returns certificate with notice.
Pilot license	do	Annual, on examination	On periodic examination	Annual, on examination.
Students	do	No license until solo stage	No mention	No license until solo stage; nonlicensed persons must be accompanied by licensed pilot.
Fees	do	Private plane, $15; commercial plane, $50; private pilot license, $10, commercial pilot, $50; manufacturer or dealer license, $50 for 3 planes.	do	Place registration, $25; experimental registration, $4; initial pilot examination, $15; annual pilot examination, $10; semiannual pilot examination, $5; operating license, $5, transfer, $1.
Suspension or revocation.	do	No mention	Pilot license may be suspended or revoked on hearing.	For sufficient cause.
Traffic rules	do	Board may prescribe	No mention	No mention.
Acrobatics	Prohibited over thickly settled areas or assemblies.	Prohibited over populated areas	do	Prohibited over thickly settled areas or assemblies.
Normal altitude	Flying unlawful at such low altitudes as to endanger or interfere with existing use	Minimum over cities, 1,000 feet; over thickly populated premises 250 feet, except in fog or forced landing	do	At least 2,000 feet over thickly settled areas or assemblies.
Nonresidents	No mention	Private operation only exempt 15 days, conditional on compliance with home State, foreign, or Federal registration and license laws.	do	Exempt 30 days if plane registered and pilot licensed, home State or Federal. If no home State law, commissioner may waive provisions. Exhibitions or flights for hire require compliance. Arrivals to be reported in 48 hours.
Exemptions	do	Pilots and craft of U. S. Government.	Aircraft of U. S. Government and sovereign States and countries	Pilots and aircraft of U. S. Government.
Violations	Penalty varies.[2] The uniform State law also includes penalty for hunting with aircraft.[2]	$25-$100	$20-$500	Not more than $100 or six months, or both.
Relation to Federal law.	Law construed to harmonize with Federal laws.	Provisions of the act may be waived by board if conditions of Federal regulations are met.	Regulations which may be promulgated by the commission to be in harmony with Air Commerce Act.	No mention
Miscellaneous		Board empowered to regulate all navigation, inspection and examination of pilots and craft, regulate traffic, and field markings. (Act 17, approved Feb. 16, 1927.)	Commission to generally foster air commerce, provide regulations, encourage airports, airways, record accidents, National Guard may set aside fields for air commerce and forestals. (H. B. 79, approved May 5, 1927.)	Commissioner may make, alter, or repeal all regulations. Pilot and employer liable for damage due to negligence. Other provisions include reporting of damages, inspection of airports, tampering with aircraft, airports, or airways, reports of accidents, etc. (Approved May 10, 1917, ch. 324.)

[1] "Registration" as used herein means official entry or record of aircraft, whether licensed or merely identified.

[2] Delaware—Maximum $500 or 1 year, or both. Idaho—Maximum, $100 or 6 months, or both. Maryland—Maximum $1,000 or 6 months, or both. Nevada—Maximum $500 or 6 months, or both. North Dakota—Maximum $500 or 1 year, or both. South Dakota—Maximum $1,000 or 6 months, or both. Tennessee—Maximum $500 or 1 year, or both. Utah—Maximum $300 or 6 months, or both. Vermont—Maximum, $100 or 1 year, or both.

[3] Law covers all aircraft, however, whether lighter or heavier than air.

	KANSAS	KENTUCKY	LOUISIANA	MAINE
Authority	Aircraft board, 3 members	Air board, 5 members	No mention	Secretary of state.
Aircraft registration and inspection.	Annual, on inspection	No mention	do	Annual, on inspection.
Transfer	Vendor notifies board, vendee requests transfer	do	do	Registration expires and vendor notifies secretary of state.
Pilot license	Annual, on examination	do	do	Annual, on examination.
Students	No license until solo stage	do	do	No license; must be accompanied by licensed or military pilot.
Fees	Registration and inspection, $15; other inspection, $2.50, pilot license, $ 0; manufacturer and dealer license, $20 for 3 aircraft and $1 each additional, three for $1.	do	Bond in sum of $15,000 for 1 airplane and $1,000 for each additional airplane to cover injuries to persons or property required in carrying passengers for hire.	Registration, $5; inspection, $5; pilot examination, not over $25; operating license, $2; passenger-carrying permit, $1.
Suspension or revocation.	No mention	do	No mention	On hearing for sufficient cause.
Traffic rules	Board may prescribe	do	do	Provided
Acrobatics	Prohibited over thickly settled areas	do	do	Prohibited over thickly settled areas or assemblies.
Normal altitude	Minimum over cities, 1,000 feet, or anywhere under 200 feet, fog and forced landings excepted	do	do	Minimum altitude 1,000 feet in city limits.
Nonresidents	Exempt 30 days if plane registered and pilot licensed in home State; flight for hire requires compliance.	do	do	Private pilots exempt 15 days if licensed in home State; commercial pilots and passenger aircraft must comply.
Exemptions	Pilots and craft of U. S. Government.	do	do	Pilots and planes holding Federal authority.
Violations	$25-$500	do	Maximum of $1,000 or 6 months, or both.	$10-$100 or 1-6 months, or both.
Relation to Federal law	No mention	do	No mention.	
Miscellaneous	Board authorized to regulate and control air navigation, including markings for airports. (Ch. 264, approved Mar. 1, 1921.)	Board may acquire land and equipment and provide airports and airways. (Approved Mar. 3, 1926.)	Act mentions only operators carrying passengers for hire. (Act 52, approved June 26, 1926.)	Permit necessary to carry passengers for hire. Pilots must maintain log. (Laws of 1923, ch. 220, as amended, 1925, ch. 185.)

Each of the following States requires original or periodic examination of pilots and inspection of planes:

Arkansas, Connecticut, Colorado, Florida, Kansas, Maine, Massachusetts, Minnesota, Pennsylvania and Wyoming.[3]

A similar requirement prevails in all Territories and possessions of the United States[2] and in the District of Columbia[2] and the Panama Canal Zone.[2]

The State laws hereinafter digested do not, of course, comprise either a digest of the entire law applicable in respect of the registration or licensing of pilots and aircraft, or all the air-traffic rules applicable to interstate or intrastate air navigation. Under the Air Commerce Act of 1926 the air-traffic rules promulgated by the Secretary of Commerce apply to all air navigation, commercial or non-commercial, interstate or intrastate.

Under the Air Commerce Act of 1926 the requirements as to the registration of aircraft and certificates of airworthiness therefor and as to certificates for airmen apply not only to interstate transportation of passengers or property for hire but also to interstate "navigation of aircraft in furtherance of a business, or navigation of aircraft from one place to another for operation in the conduct of a business."

Such requirements also apply to such transportation and navigation between two points in the same State but through any place outside thereof, and between two points within the Territories of Alaska or Hawaii or the District of Columbia or any possession of the United States.

REGULATORY POWERS—AIR COMMERCE ACT

SEC. 3. [Regulatory powers.] The Secretary of Commerce shall hy regulation—

(*a*) Provide for the granting of registration to aircraft eligible for registration, if the owner requests such registration. No aircraft shall be eligible for registration (1) unless it is a civil aircraft owned by a citizen of the United States and not registered under the laws of any foreign country, or (2) unless it is a public aircraft of the Federal Government, or of a State, Territory, or possession, or of a political subdivision thereof. All aircraft registered under this subdivision shall be known as aircraft of the United States.

(*b*) Provide for the rating of aircraft of the United States as to their airworthiness. As a basis for rating, the Secretary of Commerce (1) may require, before the granting of registration for any aircraft first applying therefor more than 8 months after the passage of this Act, full particulars of the design and of the calculations upon which the design is based and of the materials and methods used in the construction; and (2) may in his discretion accept in whole or in part the reports of properly qualified persons employed by the manufacturers or owners of aircraft; and (3) may require the periodic examination of aircraft in service and reports upon such examination by officers or employees of the Department of Commerce or by properly qualified private persons. The Secretary may accept any such examination and report by such qualified persons in lieu of examination by the employees of the Department of Commerce. The qualifications of any person for the purposes of this section shall be demonstrated in a manner specified by and satisfactory to the Secretary. The Secretary may, from time to time, rerate aircraft as to their airworthiness upon the basis of information obtained under this subdivision.

(*c*) Provide for the periodic examination and rating of airmen serving in connection with aircraft of the United States as to their qualifications for such service.

(*d*) Provide for the examination and rating of air-navigation facilities available for the use of aircraft of the United States as to their suitability for such use.

(*e*) Establish air-traffic rules for the navigation, protection, and identification of aircraft, including rules as to safe altitudes of flight and rules for the prevention of collisions between vessels and aircraft.

(*f*) Provide for the issuance and expiration, and for the suspension and revocation, of registration, aircraft and airman certificates, and such other certificates as the Secretary of Commerce deems necessary in administering the functions vested in him under this Act. Within 20 days after notice that application for any certificate is denied or that a certificate is suspended or revoked, the applicant or holder may file a written request with the Secretary of Commerce for a public hearing thereon. The Secretary, upon receipt of the request, shall forthwith (1) arrange for a public hearing to be held within 20 days after such receipt in such place as the Secretary deems most practicable and convenient in view of the place of residence of the applicant or holder and the place where evidence bearing on the cause for the denial, suspension, or revocation is most readily obtainable, and (2) give the applicant or holder at least 10 days' notice of the hearing, unless an earlier hearing is consented to by him. Notice under this subdivision may be served personally upon the applicant or holder or sent him by registered mail. The Secretary, or any officer or employee of the Department of Commerce designated by him in writing for the purpose, may hold any such hearing and for the purposes thereof administer oaths, examine witnesses, and issue subpoenas for the attendance and testimony of witnesses, or the production of books, papers, documents, and other evidence, or the taking of depositions before any designated individual competent to administer oaths. Witnesses summoned or whose depositions are taken shall receive the same fees and mileage as witnesses in courts of the United States. All evidence taken at the hearing shall be recorded and forwarded to the Secretary for decision in the matter to be rendered not later than 10 days after completion of the hearing. The decision of the Secretary, if in accordance with law, shall be final. The denial, suspension, or revocation shall be invalid unless opportunity for hearing is afforded, notice served or sent, and decision rendered within the respective times prescribed by this subdivision.

	MASSACHUSETTS	MICHIGAN	MINNESOTA	NEW JERSEY*
Authority	Registrar and advisory board of at least 3 members.	No mention	Adjutant general	No mention
Aircraft registration and inspection.	Annual, on inspection	Aircraft must comply with Federal regulations.	Semiannually on inspection	Do.
Transfer	No mention	No mention	No mention	Do.
Pilot license	Annual on examination	Pilots carrying passengers for hire must have Federal license.	On examination	Do
Students[5]	No license; must be accompanied by licensed pilot, unless over approved field.		No mention	Do.
Fees	Pilot license, $2; examination, $5; plane registration, $15.	No mention	Registration, $10; renewal, $2; pilot license, $10.	Do.
Suspension or revocation.	On hearing, for cause	do	For cause	Do.
Traffic rules	Registrar may provide	do	No mention	Do.
Acrobatics	Prohibited over thickly settled areas and in commercial passenger carrying. Wing walking, transfer, etc., prohibited.	do	Prohibited over thickly settled areas or assemblies.	Do.
Normal altitude	Minimum, 3,000 feet over thickly settled areas; 1,000 feet over assemblies; 500 feet over any building or person.	1,500 feet over assemblies except at flying fields.	Such as to enable glide to landing.	Minimum altitude, 2,000 feet over assemblies.
Nonresidents	Private pilots and planes or commercial pilots and planes in interstate traffic which have complied with home or Federal laws exempt; all others must comply.	do	No mention	No mention.
Exemptions	Pilots and craft of the State or U. S. Government, or licensed pilots and registered planes under Federal authority; experimental craft.	do	Pilots and aircraft of the State or U. S. Government.	Exhibitions under auspices of county or State fairs.
Violations	$10-$100 or 1-6 months, or both	$10-$100 or 90 days, or both	Violation is misdemeanor	$25-$200 or not more than 90 days, or both.
Relation to Federal law.	None except as above	As above	No mention	No mention.
Miscellaneous	Other requirements are set as to landing in public parks, establishment of landing places, reporting damage to planes, limitation of load, etc. (Acts of 1922, 534, secs. 35-40; acts of 1925, 189, secs. 41-59.)	These regulatory provisions are in addition to the provisions of the Uniform State Act. House enrolled Act 127, Public Act 138, approved May 11, 1927.	The adjutant general is charged with promulgation of regulations; these were published as G. O. 18, Sept. 1, 1927. (Approved Apr. 25, 1925, ch. 406.)[4]	Operator not relieved by provisions from civil or criminal liability. There is also an act of 1913 which regulates aerial exhibitions at public assemblies. (Approved Mar. 31, 1921, ch. 124.)

4 Law of 1921 set 2,000 feet over cities, with fine not over $100 or 60 days, or both. This law not repealed by 1925 act.

	OREGON	PENNSYLVANIA	WISCONSIN	WYOMING
Authority	Secretary of state	Secretary of internal affairs, advised by State aeronautics commission, 7 members.	No mention	Secretary of state
Aircraft registration and inspection.	Annual, on inspection	On inspection	do	Registration on presentation Federal license only.
Transfer	Vendee notifies secretary of state.	No mention	do	No mention.
Pilot license and examination.	No mention	On examination	do	On presentation of Federal license only.[5]
Students	do	Regulations provide for.	do	No mention.
Fees	Registration fee, $10; transfer fee, $1.	No mention	do	Do.
Suspension or revocation.	No mention	On hearing	do	Pilot and plane, on conviction for violation.
Traffic rules	do	Covered by regulations promulgated by Department of Internal Affairs under authority of Act.	do	Traffic rules, navigation obstruction lights, signals, etc., provided.
Acrobatics	do	do	Prohibited over thickly settled areas or assemblies.	Prohibited over thickly settled areas or assemblies, or with passengers, or over an airport, or within 1,000 feet horizontally, or under 2,000 feet above an airway, or by plane carrying passengers for hire.
Normal altitude	do	do	No flying at such low altitudes as to endanger persons below.	Minimum altitude over thickly populated areas or assemblies, 1,000 feet; elsewhere, 500 feet.
Nonresidents	do	do	No mention	No mention.
Exemptions	do	Airmen and aircraft of U. S. Government, of Pennsylvania State, or those federally licensed.	do	Do.
Violations	$10-$100	$10-$100 or not more than 30 days	$10-$100 first offense; $100-$200 or 6 months, or both.	$50-$500 or 30 days to 1 year, or both.
Relation to Federal Law.	No mention	Regulations not to be inconsistent with Federal laws and regulations.	No mention.	
Miscellaneous	Approved Feb. 11, 1921, ch. 49; amended Feb. 23, 1923, ch. 186.	Department of internal affairs authorized to adopt regulations for registration and licensing of aircraft, airmen licensing, and regulation of airports except those of U. S. Government. (Acts of Assembly No. 164, Apr. 13, 1927, No. 250, Apr. 26, 1927.)	Approved Apr. 2, 1925, ch. 35	Act also authorizes governor to set apart air space and municipalities to acquire property and conduct airports. (Approved Feb. 26, 1927, ch. 72.)

5,6 Wyoming registration not necessary in case of transit over the State.

SUGGESTED UNIFORM CITY ORDINANCE

An ordinance to require the licensing of aircraft and pilots operating over the city of.....

SECTION 1. *Be it ordained by the Common Council of the city of.....*, That on and after the first day of ....., 192.... only aircraft and pilots licensed by the United States Department of Commerce shall be permitted to operate in or over the city of.....; *Provided, however*, That this restriction shall not apply to public aircraft of the Federal Government, or of a State, Territory, or possession, of a political subdivision thereof.

SEC. 2. Any person violating the provisions of this ordinance shall upon conviction be found guilty of a misdemeanor and subject to a fine of not more than.....dollars or imprisonment for not more than.....days, or to both such fine and imprisonment.

COOK COUNTY, ILL.

The following resolutions were passed in 1927 by the Board of County Commissioners of Cook County, Ill., to bring all local activities within the scope of the regulations of the Department of Commerce:

Be it resolved, That the Board of county commissioners hereby prohibits the flying of aircraft within the corporate limits of the county of Cook, excepting such aircraft as has been inspected and licensed by the Department of Commerce of the United States and when operated by pilots possessing licenses issued by the Department of Commerce of the United States; and

Be it further resolved, That no pilot of aircraft be permitted to operate aircraft within the corporate limits of the county of Cook excepting those who are in possession of licenses issued by the Department of Commerce of the United States.

Similar ordinances have also been passed by other municipalities.

* *New York and New Jersey have recently enacted legislation requiring all planes and all pilots operating within the State to obtain Department of Commerce licenses.*

[1] *The words "hydroplane" and "aeronaut" are erroneously used, according to official nomenclature.*

[2] *Federal regulations under Air Commerce Act Control. Licensed planes are inspected, while those "identified" or merely registered are not required to be inspected.*

[3] *Registration in Wyoming dependent on Federal licenses, which require pilot examination and plane inspection.*

CITY AIR MARKING

WITH air travel developing even more rapidly than the installation of aids to navigation, the marking of cities becomes, without a doubt, the most immediately important aid.

Much of the country remains to be covered by air maps and even with these it is necessary to check location.

The Department of Commerce is urging air marking the roofs of prominent office buildings, shops, works, tanks, etc., everywhere in the United States.

The larger cities are more easily identified than the smaller ones, and the smaller the community the greater is the need for air marking. Every village is urged to display its name conspicuously. Depots and warehouses along the railroad offer particularly advantageous locations for such marking.

For information on how to mark and light roofs, write to Information Division, Department of Commerce.

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THE QUARTER CENTENARY OF HUMAN FLIGHT

THE President has authorized the calling of an International Conference upon aviation and recommended the appropriation of sufficient money properly to pay for our part in it during the commemoration of the twenty-fifth anniversary of heavier-than-air flight, which will occur this winter.

This celebration of the successful test of the Wright Brothers' invention is fraught with significance to the whole world, but, of course, with most significance to the United States.

Such a conference as the President recommends may be most fitting of all commemorative procedures.

Human flight will do more for the cause of peace, in years now very close at hand, than all the peace parleys and treaties that could be held and written in a century, the influence of such enthusiasts as Wilson for beautifully worded documents to the contrary notwithstanding. The airplane will compel peace and peace must be compelled if ever it is to come.

Already we are quite aware of what the 'plane can do for commerce, and that means material human progress. We are learning rapidly what it can do for exploration, which means conquest of the world we live in—a conquest which in its entirety was virtually impossible until air transport was perfected. The airplane's meaning to the education of the world has not been emphasized by any writer that I think of, but reflection shows at once that it has been and will be enormous, surpassing, possibly, even that of railways.

But perhaps the greatest boon which aviation will bestow upon humanity will be its doom of war. Not all the Wilsons, all the Lloyd Georges, all the Clemenceaus, did at Versailles a tithe as much toward actual abolition of armed conflict between men as Lindbergh did in his one flight overseas and his eagle tour of South America.

TEN YEARS OF AIR MAIL

TEN years of the air mail! We have just gone through the week which marked the first decade of America's flying postal service. Its growth in this half-score years has been from nothing, with 181 miles at the end of the first year, to 10,000 miles of regular routes today, over which the air mail planes fly 22,000 miles each twenty-four hours.

That is rather startling. Nearly a thousand miles each hour!

It will not be long before the entire country will have full advantage of this splendid, fast, dependable mail service. At present thirty-one states of the forty-eight are served directly. To and from most points outside these states, especially to distant points, service will even now be speeded up by the use of air mail postage stamps, because as soon as an air mail route touches the postal matter's path, as guaranteed by the old style of service, it will be transferred from old to new and make such portion of the journey as it may at the high speed.

The influence of this fast transport of our mail has been to give rise to demand for the equally fast transport of goods and pasengers and this is rapidly being competently provided for. The mail is carried safely through the air, with the loss of less than three letters in a thousand from the start and this loss greatly decreasing now. At its worst the air mail was safe for pilots, for its least favorable record has been one fatality to each half million miles. So much has security been increased since that was made that the probabilities today stand for only one fatality for each two and a half million miles of regular flight.

With the development of passenger carriage by air the aspect of air mail may somewhat change and it may not. The facts will soon be known concerning this, for passenger traffic comes along apace and soon the man who wishes to save time in travel in America will not dream of journeying by any other means than airplane.

WHY NOT AN AVIATION PLANK?

WE of the airminded should not forget that the principles of victorious politicians become the policies of the American Government. We are about to hear over our radios and read (until it hurts, as we were told to give in war time) in all our newspapers, the proceedings of the two conventions of the two great parties.

We, of the Air Klan, are not without political influence nor are the men who will devise the platforms to be adopted at those great conventions, one of which will name the man who will succeed Calvin Coolidge in the White House as President of this great country, without wit and prescience.

Therefore, why not an aviation plank in each of the great party's platforms? Nothing could be of greater import to the prosperity and progress of this country than the development of aviation. To some extent it is a governmental interest although Governmental ownership is not, thank God, shown in our cards.

The platform plank in which we and the people of the United States are most vitally concerned must call for the establishment in Washington of a Department of National Defense.

The real purpose of a plank of that sort would be to lift the weight of terrible and useless extravagance off the shoulders of the people whereon, each year, it weighs more heavily, as evidenced by this year's efforts of the Navy gang to force a two-and-a-half billion dollar appropriation down the throat of Congress—efforts that almost succeeded.

An adequate aviation plank in the two platforms would not only tend to lift the burden of such waste off the shoulders of the people, but would, perhaps, insure the nation's safety by compelling the bureaucrats in Washington to yield to proper air development, at once giving the United States an adequate defense and insuring its appropriate progress in the newest and the greatest of all transport arts.

The Navy program would be a crime unparalleled against the people of this country. Why should they toil and moil to find the tremendous sums of money required for the construction and later the operation of vastly expensive, absolutely obsolete warships, which, costing millions, would almost instantly fall victims, in event of war, to the lightning thrusts of enemy planes constructed at a cost of thousands?

The people of this country scarcely can afford so great a sum for the provision of a fleet of pleasure vessels, floating boarding-houses, for blue coats and brass buttons, even though these haughty men long since may have achieved the habit of luxuriousness unearned.

ALICE IN NAVYLAND

By

by Caldwell

(*With Apologies to Lewis Carroll*)

"LISTEN my children and you shall hear a fairy-tale made of gin and beer. So follow me closely while we descend to the jolly old land of Let's Pretend."—(*From the collected works of Curtis Wilbur or Carry Nation—I forget just which.*)

* * *

Alice was beginning to get very tired of sitting by her sister on the bank, and of having nothing to do; once or twice she had peeped into the book her sister was reading, but it had no pictures or conversations in it. "And what is the use of a book," thought Alice, "without pictures or conversations? One might as well read a Technical Report by Emory Land." She was considering in her own mind (as well as she could, for the day was hot and made her feel very sleepy and stupid) whether or not to take a ride on the Subway in order to pick up a tabloid gnuspaper for nothing, when suddenly a White Rabbit with pink eyes ran close by her.

There was nothing so very remarkable in that; nor did Alice think it so much out of the way to hear the Rabbit say to itself, "Oh dear! Oh dear! I shall be too late!" (When she thought it over afterwards, it occurred to her that she ought to have wondered at this, but at the time it all seemed quite natural.) But when the Rabbit actually took a watch out of its waistcoat-pocket, and looked at it, and then hurried on, Alice started to her feet, for it flashed across her mind that she had never before seen a Rabbit with either a waistcoat-pocket or a watch to take out of it—though of course she had seen lots of men with wrist-watches who greatly resembled rabbits. Burning with curiosity, little Alice ran across the field after the chatty rabbit, and was just in time to see it pop down a large rabbit-hole under the hedge.

In another moment, down went Alice after it; for she was quite a modern child and would cheerfully have gone anywhere, because, as she often said, "One could always walk back." In fact, like most modern little girls, she carried a pair of collapsible roller-skates in her vanity-box especially for return journeys.

The rabbit-hole went straight on like a tunnel for some way, and rather resembled the Interborough Subway in New York, except that it was clean and seemed to have some air in it. Then it dipped suddenly down—so suddenly that Alice had not a moment to think about stopping herself before she found herself falling—quite a natural experience for a modern child, to be sure. Down, down she fell—like Mr. Fall, who fell for a hundred thousand dollars—until she began to wonder if she was ever going to stop falling, when suddenly, thump! thump!—down she came upon a heap of sticks and dry leaves, and the Fall was over—and it was time to go South for the Winter.

Alice was not a bit hurt—nor was Mr. Fall, apparently—and she jumped to her feet in a moment. She looked up, but it was all dark overhead; before her was another long passage, and the White Rabbit was still in sight, hurrying down it. Away went Alice like the wind, and was just in time to hear the Rabbit say, as it turned a corner, "Oh my ears and whiskers, how late it's getting!" She was close behind it when she turned a corner, and was startled to trip and fall headlong over the poor Rabbit, who had paused, in a little lighted alcove, to comb his whiskers and sprinkle a drop of Djer Kiss perfume on his ears.

"Oh my ears and whiskers!" cried the Rabbit, as he stared at Alice "Why can't you be more careful? You've mussed up my white gloves and made me drop my fan. I'm sure you weren't raised in Boston—or you wouldn't be so rough."

"I was raised in Chicago and live in New York," said Alice, powdering her nose calmly and touching up her lips with carmine—a whole mine of it.

"That accounts for it," said the Rabbit, picking himself up and trotting away in a hurry, muttering to himself, "Oh! The Duchess, the Duchess! Won't she be savage if I've kept her waiting."

"Who is the Duchess?" asked Alice, as she ran along easily beside him; for of course, being a modern child, Alice was faster than any rabbit.

"The Duchess of Potomac," panted the White Rabbit. "She's the most important personage in the Navy—she really runs it. Her husband thinks he runs it, as he has the appointment, but naturally that's a delusion of his. He's just like any other husband—he does what his wife tells him. Oh, and won't the Duchess be savage if I'm late!"

"And who are you, anyhow?" asked Alice.

The White Rabbit stopped in sudden amazement. "You don't know who I am!" he cried aghast. "And I've pushed my picture into the gnuspapers whenever the editors weren't looking! Such is fame! Why, my child, I'm an important official of the National Aeronarcotic Association."

"Why, of course," said Alice. "I see the resemblance, now you mention it. But if you were in such a hurry why didn't you go by airplane?"

The White Rabbit leaped away from Alice as though she had stung him. "Oh dear! Oh dear!" he cried nervously. "Now you've brought on my heart palpitations. What did you have to go and mention airplanes for?"

"I thought you liked them," said Alice.

"So I do," replied the White Rabbit—"for publicity purposes. But not to ride in. Didn't you ever read Mother Goose?"

"Of course," said Alice, "also Elinor Glyn and Jim Branch Cabell. I know my onions."

"Then you've heard this rhyme," replied the White Rabbit, considerably relieved. He began to recite in a little thin voice with a Harvard Square accent:

"How doth the little aeroplane
  Wiggle its tail and rudder;
But when it leaps into the air
  I stay on the ground and shudder.

And while the pilot is aloft
  Cutting all sorts of capers,
I'm doing my best to get my name
  In all of the funny papers."

"That's very pretty," Alice applauded.

"And very true," added the White Rabbit, "though of course you'll understand I'm not speaking for publication now—or I'd speak differently. This is just between ourselves, as the officer remarked to the airplane manufacturer

when he accepted the Marmon sedan from Cleveland."

"Of course," Alice agreed. "But how about the Duchess?"

"Oh dear!" cried the White Rabbit, "I must hurry."

He rushed away, fanning himself, while Alice hurried along beside him. They went swiftly through tunnels, twisting and turning, until they came out at last before a huge long low building standing in a park. There was a large door marked, "Entrance," through which a file of men were walking with bundles of blue-prints under their arms; and there was a sort of chute marked "Exit," through which they were shot a few seconds later, still holding the blue-prints. As each man was shot out onto the grass, he picked himself up, brushed the dirt from his clothes, collected his papers, and again went in through the entrance. But in practically no time at all, out he came through the chute, to pick himself up and go through the performance all over again.

"Dear me!" exclaimed Alice, staring in wonder as a man shot out and landed on his left ear, while his bundle of blue-prints unrolled and blew down the street. "Are they doing that for fun? And who are they?"

"They're not," said the White Rabbit. "They're airplane manufacturers trying to sell their latest airplanes to the Navy. They're confirmed optimists, every one of them. That one trying to pull the horse-chestnut out of his ear is Bellanca; that one who has just landed upside down on the model of his latest bomber is Sikorsky. But it doesn't matter; they'll both pick themselves up and go in again. There they go!"

"How odd!" cried Alice. "I'm sorry for the poor fellows."

"You needn't be," said the White Rabbit. "They're used to it, especially those two. I'm only worried for fear the Navy will accept one of their planes—the shock would kill them, poor chaps! But come, I'll take you in."

"I don't like the look of that chute," said Alice. "It seems to work too well."

"That's all right," the Rabbit assured her. "You don't especially like airplanes, do you?"

"Not especially," said Alice. "To tell you the truth I don't know much about them."

"Then you'll be among friends, here," said the Rabbit, hurrying into the Navy Building with Alice right behind him.

Just inside the door stood a footman in livery—(Alice considered him to be a footman because he was in a uniform; otherwise, judging by his face only, she would have called him a fish. He looked exactly like a large codfish; his eyes were round and staring, and his forehead was low and retreating, while his chin simply melted off into his neck, which was very round and fat.) "What a peculiar creature!" Alice exclaimed.

"That's a yeoman—a Naval yeoman," whispered the White Rabbit. "He's been in the Navy for a long time—that's why he looks that way. How are you, Coddy?"

The Fish-Footman looked up and blinked his eyes, at the same time producing from under his arm, or fin, a great letter, nearly as large as himself, which he handed over to the White Rabbit, saying in a solemn tone, "From the Duchess. An invitation to play golf."

"Oh dear! How lovely," cried the White Rabbit. "We shall go right in."

He stepped over and knocked at a door behind the Footman. That odd gentleman looked at him in silence for several moments, while the Rabbit continued knocking.

"There's no sort of use in knocking," said the Fish-Footman at last. "Billy Mitchell knocked there for years —and what good did it do him? It will do you no good, for two reasons: First, because I'm on the same side of the door as you are: second, because they're making such a noise inside, no one could possibly hear you." And certainly there *was* a most extraordinary row going on within —a constant howling and sneezing, and every now and then a great crash, as if a dish or kettle had been broken to pieces.

"How are we to get in?" asked the White Rabbit.

"The burning Naval question," said the Footman, "is not how to get in, but how to get out. The Navy is always getting into things, and having a devil of a time explaining its way out. His Excellency, Curtis, Duke of Potomac, is the official explainer—and he's about worn out. That last submarine nearly sunk him."

"But I must get in," urged the Rabbit. "That's what I'm in the N. A. A. for—to get in socially in Washington. That's why our members are putting up five dollars apiece —so I can wear a dress suit."

"There might be some sense in your knocking," the Footman went on, "if we had the door between us. For instance, if you were *inside*, you know, you might knock and I could let you out. We've let out a good many, in our time—Sims and Magruder, and a lot more."

"This Footman seems very stupid," Alice whispered.

"Wait until you see an Admiral," the White Rabbit muttered. "You'll think this fellow actually bright."

"I shall sit here," the Footman remarked, "till they sell battleships in Woolworth's—"

At this moment the door opened, and a large plate came skimming out, straight at the Footman's head; it just grazed his nose and broke to pieces against the wall.

"—or next day, maybe," the Footman continued in the same tone, exactly as if nothing had happened. In fact, he had been in the Navy so long that nothing short of cutting down an appropriation would have disturbed him. "I shall sit here," he said, "on and off—mostly off—for days and days, and years and years, doing nothing. Then I'll get a pension, and keep on doing it. Tax-payers are funny things, aren't they?"

"Oh, there's no use in talking to him," said Alice desperately: "he's perfectly idiotic."

"I'm not a tax-payer," chuckled the Footman throatily, "so I have the laugh on you there. Imagine a tax-payer laughing at anyone in the Navy! Still, they pay high enough for the privilege, so I don't begrudge them their laugh."

Alice darted by him suddenly, and opened the door at which the poor Rabbit had been knocking timidly during all this while. "Well!" she exclaimed, and instantly fell down several steps into a large kitchen, which was full of smoke from end to end. It seemed to be coming from a big Teapot that was bubbling away like mad on a stove which two Senators were stoking furiously with coal.

"I'm glad you've dropped in," said the Duchess, who was seated by the stove nursing a squalling baby. "Most people find it rather a come-down entering the Navy. If you find the air a trifle smelly, just stick your head out a porthole and see the world."

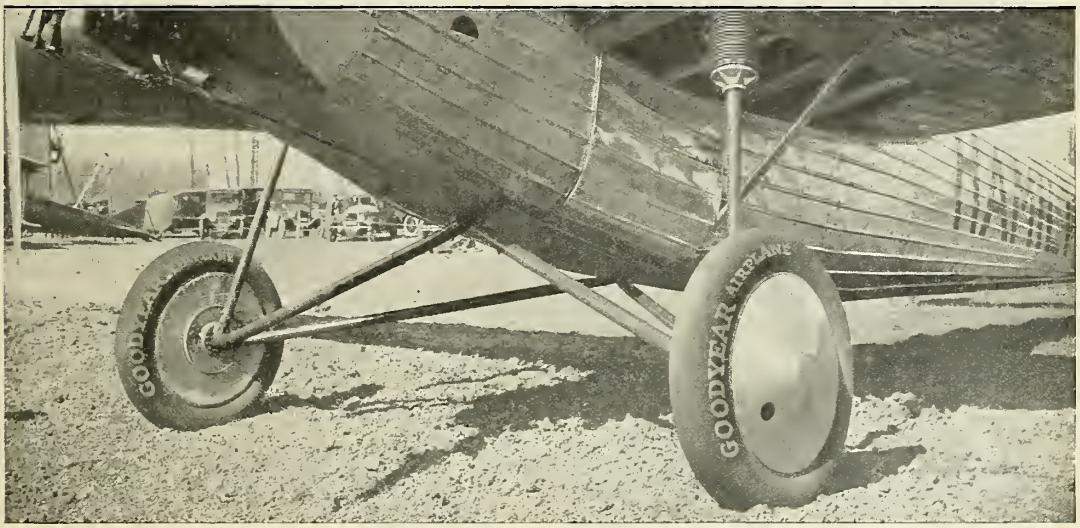
"There *is* a peculiar smell here," stammered Alice, who had not yet recovered from her shock of entering the Navy so abruptly.

"An oily smell?" inquired the Duchess, turning the baby upside down and shaking him soundly, at which he yelled all the louder. "That's Teapot Dome, boiling away. It *is* a bit thick, isn't it? Teddy Roosevelt, Jr., couldn't stand it. He left. But there's always something—Drat this child, anyway!"

(Continued on page 936)



THE DOUBLE DUTY OF TIRES



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AIRPLANE TIRES

(Alice in Navyland—Continued from page 934)

Again she shook the unfortunate infant until it absolutely howled. "It's odd," said the Duchess to Alice, and nodding pleasantly to the White Rabbit, who was bowing and scraping before her, "but I can't quiet this little wretch. I'd like to choke him!" She threw the infant roughly against the wall, but it bounced back into her lap, and howled all the louder. "I can't seem to lose him, no matter what I do," complained the Duchess.

"Why should you lose him?" asked Alice, quite shocked at the rough treatment the infant was receiving. "Isn't he your baby?"

"Only adopted," cried the Duchess—"and I don't know why in the world I adopted him. Be quiet, Avvy, you little pig, or I'll strangle you."

"Avvy? That's a funny name," said Alice.

"His full name is Aviation," said the Duchess, throwing him down on the floor, from which he bounced up again like a rubber ball—he seemed practically indestructible. "I call him Avvy for short—and I keep him as short as I can. He outgrows things so. And he doesn't get on with the others."

The Duchess indicated a row of cribs along the wall, where several fat babies, apparently very well fed, were dozing away through all the racket. They looked very quiet and sluggish, Alice thought.

"There's Batty, now," continued the Duchess, indicating the fattest and heaviest creature; "I never have the least trouble with him. He's the most peaceful and harmless thing in the world—aren't you, Battleship darling?" She shook her head playfully at the heavy infant, who gurgled once and sunk into somnolence. "And there's Cruisey—he's the one in the next cot; his full name is Cruiser—not a whimper out of him; he sleeps all the time. And little Dessy—well, he's a trifle lively at times, but he's harmless enough, aren't you, my little Destroyer?" She winked playfully at the infant, who was clutching at the bars of his crib and bouncing about in a highly diverting manner.

"He seems to be the only one with any life to him," remarked Alice. "I suppose he's your favorite?"

"Not at all," retorted the Duchess, staring at Alice with considerable surprise. "It costs very little to feed him. Batty, now—there's an expensive infant for you," said the Duchess proudly. "How he does eat! It costs a fortune merely to keep him in powder."

Alice was surprised that the Duchess should value her children mainly on account of their size and the expense of maintaining them; but, like a sensible little girl, she soon came to the conclusion that the old Duchess was more than a little mad, and therefore made allowances for her accordingly.

"Subby! Come out of that water this instant!" screamed the Duchess, turning around and glaring at a lusty youngster who was splashing about in a wash-tub set on the floor. Subby instantly dived to the bottom of the tub, and perhaps never would have come up if the Duchess hadn't thrown Avvy to the floor and rushed to the tub, in which she fished about and from which she drew the unfortunate Subby, half full of water.

"What odd names you have for your children!" exclaimed Alice, while the Duchess turned Subby upside down and let the water run out of him.

"You mean Subby?" queried the Duchess, shaking the water from him. "His full name is Submarine—and he's full most of the time. Whenever I let him play in the water, he invariably sinks, and fills up. But he's a good child—he costs quite a lot, one way or another."

The Duchess placed Subby in his crib and picked Avvy up from the floor, soothing him with this little song, which she sung in a loud, grating voice:

"Speak roughly to your little boy,
And beat him when he sneezes;
He only does it to annoy,
Because he knows it teases."

The chorus, in which the baby joined, went: "Wow! Wow! Wow!" It was very beautiful, indeed, the White Rabbit told Alice, who was by now pretty sure she had got into a mad-house—as, in truth, she had.

"Well, I can't do a thing with him," said the Duchess at last, as she stopped singing and threw the baby into a crib, from which he bounced out onto the floor, just as a mild-mannered man wearing glasses entered the room and gazed diffidently about at the confusion.

"Quite a lot of noise, my dear," he remarked mildly to the Duchess. He looked helplessly about him, first at the Duchess, then at Alice, then at the White Rabbit, and finally at the several infants, from whom he turned with a shudder. "There are times," he said mildly, "when I feel quite lost—I really do." He looked at Alice, as though hoping for sympathy. "The reporters were very trying this morning," he said. "They kept asking me worrying questions about the Navy—and what do I know about the Navy? Is it my fault if everything sinks?"

"That's the Duke of Potomac," whispered the White Rabbit to Alice. "He gets in the papers whenever anything goes down. I, on the other hand, manage to get in when anything goes up. It's quite a system, isn't it? It proves the beautiful balance maintained in the world."

"If someone," said the Duke of Potomac, gazing earnestly at Alice, "if someone only would invent a submarine that could stay on top of the water, how nice that would be, wouldn't it?"

"It would be a pleasant change for us," shouted the Duchess to Alice. "Have you any ideas on the matter?" She stopped suddenly and remarked in a changed tone. "But how silly of me—if you had any ideas you wouldn't be here. They'd have thrown you out at the door." She started as a sudden disquieting thought struck her. "You *haven't* any ideas, have you?"

"I don't think I have," said Alice.

"That's all right, then," said the Duchess more pleasantly, and apparently greatly relieved. "We don't care for ideas here, you know."

"No, no—not at all," said the Duke, shivering slightly. "*That* was a new idea—" he pointed at little Aviation, who was rolling about on the floor and howling for attention. "We could have done without him," he said to Alice. "Our family was quite large enough. But Nature, you know—He just seemed to arrive in the Natural course of events—I don't know, I'm sure—He seems to be crowding the others, somewhat—" the poor old Duke shook his head helplessly, and sighed. "He's crowding me, too," he complained. "I don't know what the world's coming to, I'm sure. Wow!"

His jumbled remarks, given in a most plaintive tone of voice, ended on a sharp note of pain. The Duchess had thrown a flat-iron at little Avvy, which had missed that troublesome infant and caromed off the head of the Duke, who unfortunately was right in the path of the weapon.

"Pardon me," screamed the Duchess, "I wasn't aiming at you. Look out!"

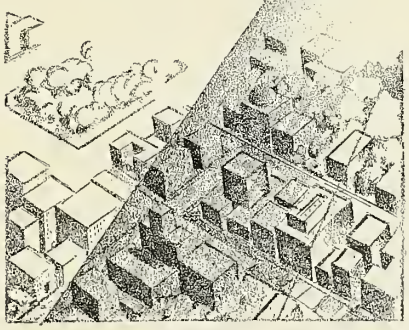
Well might she have given the warning, for she immediately set to work throwing everything in sight at the

(Continued on page 938)

when the sun is blazin'

and it's sticky down below





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(Alice in Navyland—Continued from page 936)

unfortunate infant, Aviation, most of which missed him and hit one of the others in the room. The poor old Duke of Potomac came in for a plate and a large, hard soup tureen, while the White Rabbit got a shower of small kitchen utensils that sent him scurrying around the kitchen much faster than he ever had scurried at N. A. A. Conventions, which was saying a great deal. Meanwhile the Duchess was screaming at all of them to watch out, which none of them could do. Finally she quite wore herself out, and sat down.

"There you are!" she gasped to Alice. "That's what comes of having an infant like that around to annoy you. That wretched Aviation upsets the whole Navy. Look at it now! Just look at it!"

Little Avvy, a remarkably agile child, had crawled up on top of a bureau from which he fell with a heavy crash right on top of poor Battleship, or Batty, as the Duchess called him, knocking the wind completely out of that sluggish child.

"He's always doing that," moaned the Duke. "He's knocked the wind out of all of them, one time or another. He's raised several blisters on Batty."

The Duchess rushed over and picked up Batty, and sure enough, there were two great blisters along his sides.

"Isn't it terrible?" screamed the Duchess. "Poor Batty is all knocked out of shape. Dear me! I must go out and play golf to quiet my nerves."

The Duchess rushed from the kitchen, slamming the door behind her. But the Duke of Potomac and the White Rabbit hurried after her, quite forgetting Alice. Left alone, the child looked about her and discovered a large cat, which was lying on the hearth and grinning from ear to ear. "Dear, dear!" said Alice, "why does that cat grin?"

"Because I'm a Cheshire-Cat," replied the puss. "Haven't you heard the expression, 'grinning like a Cheshire-Cat?' Well, I'm the Cat. It speaks well for my sense of humor, I think, being in the Navy and still able to smile."

The Cheshire-Cat grinned very happily at this though. "It isn't everyone who can grin in these surroundings," it continued. "They have a way of wiping grins off faces in this business. Ask Magruder."

"Who is Magruder?" inquired Alice.

"You mean, who *was* Magruder, don't you?" asked the Cat. "However, it's of no consequence. You'd only forget if I told you. Everything gets forgotten here. We call it The Land of Forgotten Men."

"Which men are forgotten?" asked Alice.

"The Junior Officers," the Cheshire-Cat replied. "We never remember them while they have any life in them. When they're practically mummies we promote them. How do you like the Duchess?"

"I'm not sure that I like her," replied Alice: "She's so cruel to little Avvy."

"She's always like that with the new ones," replied the Cheshire-Cat. "She was the same with little Destroyer, when he came. She couldn't get used to him for a long time. The old lady's somewhat behind the times, you know."

"I rather like the Duke," said Alice. "He seems so lost, somehow."

"He *is* lost," confirmed the Cat. "After the next election the Duchess will divorce him, you know."

"She will!" cried Alice.

"Of course," grinned the Cheshire-Cat. "Don't you know who she was before she married the Duke? No? Why, she was known as The Spirit of the Navy. She's been married and divorced a dozen times. The husbands change, but she goes on forever the same. Charming creature!"

The Cat grinned more malevolently than ever.

"Would you tell me, please, where I should go from here?" asked Alice, who felt she had stayed long enough.

"That depends on where you want to get to," said the Cheshire-Cat. "Very few of us here ever get anywhere."

"I don't much care where—" began Alice.

"Then it doesn't matter which way you go," said the Cat. "You might go into civilian life."

"Where is that?" asked Alice.

"Where no Admiral ever wants to go," said the Cat, "especially on half pay. I'll tell you, my child: In that direction lives a Hatter, and in that direction lives a March Hare." The cat waved its paw to right and to left. "Visit either you like: they're both mad."

"But I don't want to go among mad people," Alice remarked.

"Oh, you can't help that," said the Cat. "We're all mad here."

"How do you know I'm mad?" said Alice.

"You must be," said the Cat, "or you wouldn't have come here. Well, good-bye."

The Cheshire-Cat grinned again from ear to ear, and disappeared up the chimney.

"How odd," thought Alice. "I'd better get out of here. Everything seems very strange in the Navy."

She opened a door and saw before her a long corridor from which many glass doors opened into large rooms. As she walked along the corridor Alice peeped in through the glass and was surprised to see a number of very old and important looking men seated at desks. All of them were fast asleep, and snoring away very musically. There was no sign of activity anywhere, until she had passed almost the whole length of the corridor, when she came to a door marked, "Bureau of Construction and Repair." Inside was a man with a very large hat on his head. He was drinking tea and chatting amiably with a hare.

"That must be the Hatter," whispered Alice, "and the March Hare. I wonder if they're very mad to-day?"

She was about to pass on when the Hatter looked up and saw her. "Come in! Come in!" he cried. "We've been waiting for you. Come in!"

Alice thought it very strange that they should be waiting for her, but as she was a modern child she never liked to keep any of the boys waiting, so in she went.

"Have some tea," said the Hatter. "I know you're one of us. If you weren't, you'd be asleep, you know."

"Why would I?" asked Alice, sipping the tea; and much to her disappointment, it really was tea.

"No sane person stays awake in the Navy Department," said the Hatter. "It's too much of a strain on the mind. They just sleep until they get pensioned off. It's much the best way. We're quite mad, the March Hare and I; that's why we're awake."

"Yes, indeed," said the March Hare. "And we're awake because we're too mad to go to sleep. You saw the sign?"

"You mean, Bureau of Construction and Repair?" asked Alice.

"Yes, we're the Bureau."

"But you say you're mad!" exclaimed Alice.

"Of course," said the Hatter. "If you don't believe us, go and look at some of the constructing and repairing we do—it's unique; it really is."

"And it costs so much," said the March Hare. "That's the beauty of it."

"The principal beauty," corrected the Hatter. "It's all

(Continued on page 1058)

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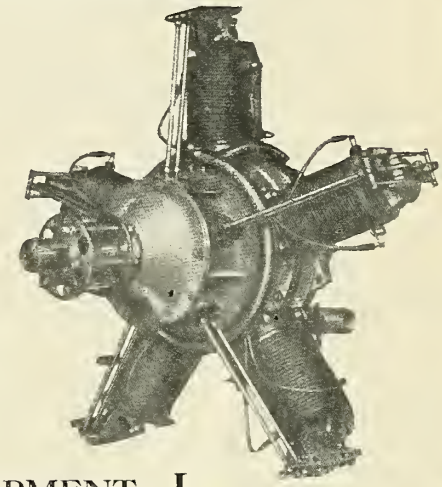
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AIRCRAFT ENGINEERING CONFERENCE

At Langley Field, Va.

By Dr. Michael Watter

THE third annual aircraft engineering research conference took place at Langley Memorial Aeronautical Laboratory, Langley Field, Va. It was sponsored by the National Advisory Committee for Aeronautics, which was established in 1915 by an act of Congress for the purpose of "supervision and direction of the scientific study of the problems of flight, with a view to their practical solution, the determination of problems which should be experimentally attacked, and their investigation and application to practical questions of aeronautics."

The Langley Memorial Laboratory, the committee's research laboratory, presents an ideal place for the purpose of a research conference. It gives the engineer and manufacturer an opportunity to inspect and acquaint himself with the equipment at the disposal of the committee to conduct scientific experiments while the contact with the personnel leads to an exchange of ideas and personal acquaintanceship so valuable for a better mutual understanding.

The larger equipment inspected by the members of the conference consisted of an atmospheric wind tunnel, variable density tunnel, high speed jet tunnel, demonstration water tunnel, power plant laboratory, flight research laboratory, and propeller research laboratory. Besides the larger equipment, members of the conference were shown various smaller research equipment and installations and the half day allowed for this part of the program was scarcely long enough to inspect minutely and absorb the variety of information and apparatus which were demonstrated.

Atmospheric Wind Tunnel

In the atmospheric tunnel in connection with the research on action of trailing edge flaps a visual demonstration was given of the pressure distribution over the chord of an airfoil fitted with a flap. The demonstration was made for a flap angle of $\pm$ 25° and for two angles of attack of + 8° and + 27°. At the smaller angle of attack the pressure distribution is of the normal type and the difference in load with the flap up and down is considerable. At plus 27° the load is almost uniform over the chord but the difference between the loads with the flap up and down is considerably less than in the previous case. This test is being made on a large size model which represents a rectangular portion of an airfoil fitted with a flap and mounted between two plates to simulate a uni-planar flow condition. Besides, a rig was shown to study the autorotation of airfoils and cells. It represents an electric type dynamometer inclosed in a streamlined body and mounted in the experimental throat of the tunnel by means of wire suspension. On the extension shaft of the dynamometer a cell or a wing can be mounted at a desired angle of attack in order to measure autorotational speeds and couples.

In addition to experiments on flaps and spinning the program of the atmospheric tunnel includes an extensive series of tests on various cell arrangements including the effect of stagger, sweepback, decalage and different airfoil combinations.

Variable Density Tunnel

In the variable density tunnel, charts were displayed of different airfoils and model planes tested at a wide scale of Reynold's Numbers. It was interestintg to see the close agreement reached between free flight tests and model tests made at a corresponding VL. The general rsults would indicate that at high value of Reynold's Numbers the lifting properties of profiles of various thicknesses are much closer than indicated by the atmospheric tunnel; this is also true for the drag. The behavior of various profiles, however, is very dissimilar which presents a serious handicap in typical classification of airfoils with a view of analytical prediction of VL effect.

In order to utilize the energy of the compressed air used for the variable density tunnel a vertical jet tunnel was designed and installed in the same building. It is of an open chamber type with a throat diameter of 12 inches. The compressed air from the variable density tunnel is conducted to an annular ring at the exit cone and is discharged tangentially to its walls. Due to high velocity of the jet a depression is created in the discharge cone and the resulting difference of pressure causes the air to flow with a maximum speed of about 900 m.p.h. The maximum possible duration of flow is 45 minutes.

For the purpose of visualizing the flow around various objects, a water tunnel was built by the committee and its demonstration fascinated many visitors because of its clearness. This tunnel is of a rectangular cross section and the demonstration was made of a uni-planar flow around an airfoil at normal angles of attack and also of flow beyond the burble point, flow round a cylinder and a flat plane at various angles. The stream was colored and it was interesting to observe the formation of Karman's vortices and see the constant reformation of the stable staggered vortex arrangement.

Power Plant Laboratory

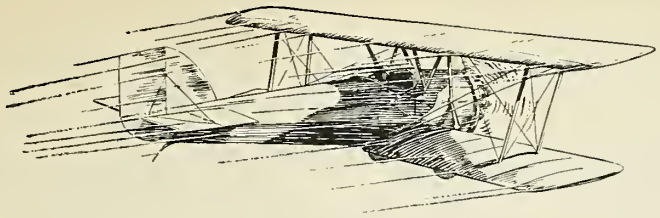
The research here is concentrated on two-cycle engines, supercharging, and conditions of operation and power output with various fuels. The visitors were shown a demonstration model of a projected two-cycle air-cooled Liberty engine cylinder.

Root's type superchargers were shown which have proven highly satisfactory under actual service conditions. The committee has constructed various sizes capable of developing sea level power up to 22,000 feet. Difficulties originally experienced with the cam impeller were remedied by making them of magnesium aluminum alloy, while distortion of the casing is prevented by casting sides and covers in one piece.

A demonstration was made of the behavior of ordinary aviation gasoline detonating at high crankshaft speed, while a mixture of benzol permitted operation at practically the same crankshaft speed but with noticeable increase in torque as indicated by the dynamometer.

The most interesting part was the demonstration of a two-cycle Diesel type cylinder operating on heavy oil. It has no electrical ignition and no carburetor, the fuel being sprayed in the dome compression head through seven orifices. In the operation of the Diesel high speed type cylinder particularly noticeable features were smoothness of running, great elasticity of operation and rapid acceleration. From a few hundred r.p.m. the speed was quickly accelerated to 2,000 r.p.m.

The important accomplishment is reduction of maximum pressure from about 2,000 pounds per square inch to 550 pounds per square inch which approximates the pressure in normal engines having electrical ignition. The reduction in maximum pressure, (*Continued on page 942*)



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leads to a reduction in weight. In combination with lower specific fuel consumption and absence of fire hazard this type of engine seems to combine many desirable features.

In connection with the Diesel engine research a most thorough study of spray formation is conducted by the committee. The spray formations are analyzed by means of spray photography with high speed moving pictures at rates up to 4,000 pictures per second.

Flight Research Laboratory

This laboratory has undertaken the very timely question of ice formation on the wings of a plane at low temperatures. The results indicate that there are two definite conditions of ice formation—one is at points very near to freezing temperature when considerable humidity is present; in this case the ice masses on the leading edges of wings, wires and struts in a distinctly mushroom formation which results in a decided change of aerodynamic forms. The second condition of ice formation occurs at lower temperature and is not dangerous because the icy formation on the leading edges has a pointed form which is not so harmful to aerodynamic properties of profiles. This leads to a very interesting conclusion that formation of ice can be prevented by keeping out of the zone of high humidity and choosing rather colder and dryer regions, i.e. going preferably to a higher altitude.

The flight laboratory is continuing its research on pressure distributions over wings and controlling and stabilizing surfaces of PW-9, VE-9 and TS airplanes for various flight conditions and also studies the distribution of pressure on the bottom of seaplane floats in landing. These studies are made by means of ingenuous self-recording apparatus giving continuous and simultaneous record.

The laboratory has a NY-1 Navy training plane equipped with lateral leading edge slots and Friese ailerons.

Propeller Research Laboratory

The propeller research laboratory is an open type 20-foot wind tunnel capable of throat speeds up to 110 m.p.h. Current program includes the study of effect of various cowling and body shapes on propulsive efficiency and the cooling characteristics of the engine.

A full sized body with a Wright Whirlwind engine is mounted on a balance and observations are taken with the engine running to simulate the actual flying conditions. An interesting feature of the set-up is the fact that the engine is not attached to the body proper but to a steel framework housed inside. This permits an independent measuring of propeller torque and thrust in the presence of the body and also the resistance of the body with the effect of propeller slipstream.

Besides purely propeller research the propeller research laboratory affords an excellent means of study of interaction between propeller and body or wings, various cooling systems and power plant installations with particular reference to air-cooled engines and cowling problems. It is particularly adapted to the study of stabilizing and controlling tail surfaces, hinge moments, and downwash with and without slipstream effect.

* * *

This account presents merely a brief description of various subjects discussed and demonstrated during the conference and is intended primarily to show the extensive resources of the National Advisory Committee and the variety of the problems which are studied by it.

The variable density tunnel presents a valuable means for the flow research and better understanding of VL effect and will give us a fuller knowledge of behavior of profiles. The divergency in results obtained in the variable density tunnel seems to indicate, however, that its possibilities and limitations have not yet been clearly defined. It would be valuable to obtain a closer coördination between the variable density tunnel, free flight tests and the ordinary atmospheric tunnel. It seems that similar tests could be very successfully carried out in the variable density tunnel and also in the propeller research tunnel which will enable one to obtain a comparatively high value of Reynold's Numbers. Final check should be made by free flight tests. This program of research could be carried out in conjunction with the proposed design of the experimental airplane.

The problems which confront the N A C A are, however, of still larger complexity for which new research alone will not suffice. The industry needs the synthesis of the results of all these researches condensed into typical averages, working formulae and definite methods.

The immense mass of available experimental data should be thoroughly analyzed and reduced to such form that it can be conveniently applied by the aeronautical engineer.

The N A C A with its outstanding equipment is in an excellent position to give all this to the industry.

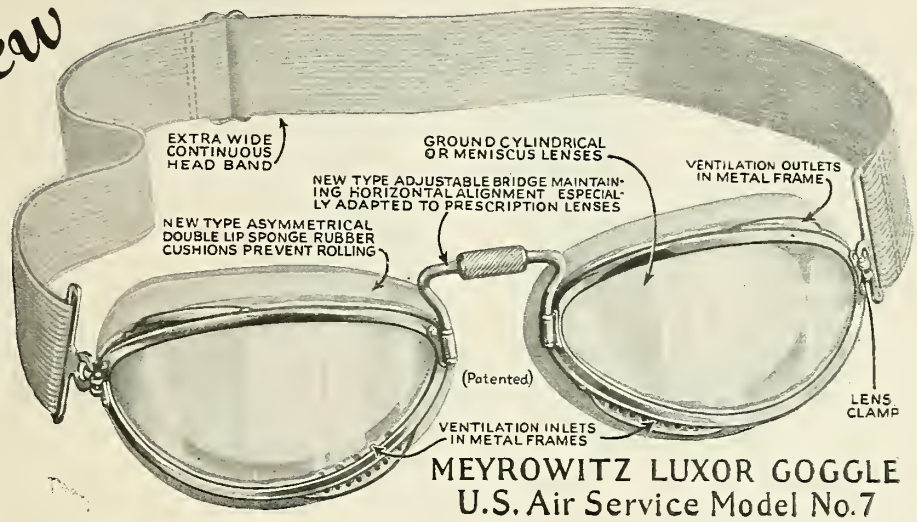


Attendants at the Third Annual Aircraft Engineering Research Conference at Langley Field, Va., May 15, 1928

(Seated on Ground)—Watson Davis, W. C. Morgan, C. W. Hicks, F. E. Weick, E. R. Sharp, R. V. Rhode, E. D. Osborn, S. J. DeFrance. (Second Row)—E. M. Bertran, C. E. Kissinger, W. F. Joachim, T. M. Collier, A. E. Larsen, H. F. Pitcairn, Starr Truscott, H. E. Hartney, J. S. Donaldson, J. S. Ames, J. F. Victory, S. W. Stratton, Porter Adams, H. C. Richardson, F. H. Russell, H. J. E. Reid, T. Carroll, E. A. Myers, J. V. Kelley, J. R. Cautley, Russell Owen L. Christopher. (Third Row)—Henry Berliner, T. N. Joyce, W. H. Miller, D. H. Wood, C. C. Culver, C. H. Helms, H. C. Gerrish, E. S. Land, H. I. Cone W. E. Gillmore, L. C. Mulburn, W. A. Moffett, A. E. Nesbitt, R. H. Upson, C. L. Ofenstein, Lloyd Harrison, C. F. Taylor, Leslie MacDill, Etienne Dormoy G. F. McLaughlin. (Fourth Row)—C. M. Young, Carlton Kemper, R. E. Mixson, H. L. Whittemore, J. W. Crowley, Jr., C. F. Pape, C. J. McCarthy, H. Y Norwood, Michael Watter, H. K. Cummings, S. K. Colby, E. H. Dix, Jr., G. L. Martin, D. W. Taylor, W. F. Durand, Orville Wright, B. C. Boulton C. W. Howard, C. T. Porter, E. W. Miller, E. G. Beardsley, H. E. Payne. (Fifth Row)—S. J. Baum, H. A. Hicks, H. H. Haase, F. S. Kirsten, J. C McAlmunt, S. L. LaHache, W. S. Diehl, K. M. Lane, A. J. Elias, C. W. Hall, V. E. Clark, E. P. Warner, Cleburne Eberhart, Jr., H. N. Davis, L. J. Briggs M. M. Munk, Alexander Klemin, John Harding Jr., L. M. Woolson, J. W. Wagner, O. W. Schey. (Sixth Row)—R. H. Smith, Karl Arnstein, C. J Dockarty, C. H. Dockarty, Jr., E. H. Chamberlin, H. E. Lorentz, Burdette Wright, T. E. Tillinghast, J. M. Shoemaker, C. H. Chatfield, G. W. Lewis C. H. Colvin, C. B. Veal, I. H. Driggs, C. deF. Chandler, M. H. Fairbank, Spencer Heath, H. L. Dryden, J. B. Peterson, J. G. Lee, T. O. Freeman John Goldthwaite.

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GROUND FLYING

By Don Rose

NOW that I'm back in my home hangar, having survived the reconstruction period concerning which I expatiated at length in last month's issue, I am having even more fun than usual in catching up on my mail. The first job, of course, was to find it. You married fellows know and the rest of you are going to find out that when a married man goes away for a rest and change, the wife of his bosom never by any chance considers his mail of importance enough for parking space, wherefore he must spend the first day or two on his return in tracking it down to every odd corner of the house. Some of it will be in the kitchen cabinet, some of it behind the clock, some of it in the piano. Some more of it will be in the sewing machine, and odds and ends of it all over the floor and furniture.

The time has come when I greet the morning mail with new eagerness and enthusiasm. It was not always thus. It used to be that I could discount my mail long in advance and lay it out cold on a prophetic chart, from the gas bill on the 6th to the "Please Remit" from the milkman on the 30th. I could go away for weeks at a time and know to a hand's-breadth how many and important were the envelopes accumulating for me. And I also knew that there was never any necessity for me to hurry home.

But time and AERO DIGEST have changed all that. I now leap eagerly from my downy couch at 8:15 or even earlier, quivering to know the best and worst, and with hands that shake as they grasp the scrambled assortment that the U. S. Government has brought to the door. The bills, of course, are still there, and bigger and better than ever. But I pass them by without difficulty, particularly since I have trained myself to detect the stale and musty odor of a bill even through the best bond paper. I am not much interested in bills, except those rare and beautiful long green ones which are familiar to some of my readers. I prefer the little checks that flutter out of their envelopes like marvelously beautiful butterflies, singing a sweet song of happiness as they burst their chrysalis.

There is also the customary broadside from Mr. Elbert Hubbard, II, who has been trying to sell me a book for lo, these many moons. There are begging letters from magazines, threatening to round out my life and make me a happy, useful and intelligent citizen, all for four dollars a year. But the latest load on the back of Uncle Sam and the one which keeps me opening my mail with the hope which springs eternal, is made up of letters from the far-flung readers of AERO DIGEST.

I thought I made it clear, 'way back at the beginning of these discourses and diatribes, that I don't know a thing about aviation, and certainly I have done and said nothing since that time to discount my original pessimism. But despite this and nevertheless, there come these epistles, full of touching and optimistic faith and confidence, asking for advice, instruction, information, suggestion, explanation and elucidation, so that I must risk my remnants of reputation by running a regular correspondence school of practical aeronautics. Which is a situation that holds not less than two dangerous possibilities; the first that some regular pilot may get hold of one of my letters and laugh himself to death, and the second that some unfortunate amateur may one day take my advice or information seriously, and be collected in a basket.

So, me and my conscience have gone into executive session together, and have decided to offer, here and now, a ground school in aeronautics. It is, as you may see if you survive it, complete and comprehensive and inclusive of all matters of importance, and it has the special advantage of being the cheapest correspondence course in existence, the tuition fee being no more than the price of AERO DIGEST—twenty-five cents a copy, or a special reduced rate of three dollars a year. And if any of my competitors offer you a course in aviation for less than twenty-five cents, you can be pretty sure they will cut the corners of you somewhere.

This course is specially designed for some of my friends in far places. There is the boy in the Kentucky canning factory who pastes the labels on the tomato cans. He doesn't think it is much of a job, and it's small consolation to him to know that Charles Dickens spent some years of his young life sticking labels on bottles of boot-blacking. He wants to aviate. Then there is the garage helper out in Indiana who yearns beyond the bilious attacks of flivvers, and hears the inviting hum of aircraft beyond his dusty horizon. There is the farm hand in Ohio who looks up from his job of lady's maid to a pen of pigs every morning to the passing of the mail plane. There is the errand-boy in the cross roads store, the down-town messenger boy, and the boot-black in the lobby of the commercial hotel. Every one of them is hungry for the new wonder of the new world; every one of them is holding out on his pay envelope in hopes of sinking his savings some day in a flying course; every one of them is the stuff of which the future is made—and also a sucker for the right sort of bait.

So if you will give me your attention and the boys at the back of the room will put their gum away until recess time, we will take up the matter of aeronautics. This will be a practical course, since the theoretical principles of flying are so simple that even a correspondence school might teach them. Fifteen minutes a day for a sufficient number of days will make this matter of sailing a plane a matter of plain sailing. To show you how simple a thing it is to fly a plane I need only recall the experience of a friend of mine. He had read it up in the Encyclopedia, he had taken a five-dollar correspondence course, and he had watched the pilot go through the motions. So he felt justly confident of his ability to sail and steer a ship. The pilot listened and looked him over, and finally took him on, packing him into a dual-control job and lacing him in tight. The pilot insisted on taking the ship off himself since he needed her later in the week, but when they had put three thousand feet of atmosphere between them and an obituary, he let the amateur have her. So they made about 200 feet on an even keel and then started to climb. It took the novice about 500 feet to find it out, whereupon he straightened out so thoroughly that the ship started to go home at an angle of thirty degrees. This wasn't so good either, so the amateur expert leaned on the stick and she came up like a balky horse at a fence. The novice lost his goggles, the pilot lost most of his religion, and the engine lost its enthusiasm and began to think of a stall, whereupon the man at the wheel put on the brake with his left foot and she slid sideways down three hundred feet of aerial scenery and began to play tag with her tail. So the pilot yanked the stick out of danger and brought the correspondence school graduate home to mama, a somewhat sadder and certainly wiser man. The only explanation he could offer after

(Continued on page 1052)



Fokker F-7 Trimotor, 2 pilots, 8 to 10 passengers, three 200 h.p. "Whirlwind" engines. 122 m.p.h.



Fokker F-10 Super-Trimotor, 2 pilots, 12 passengers, mail and express, Pullman equipment, three 400 h.p. "Wasp" engines. 148 m.p.h.

Fokker Universal, rugged service ship, 2 pilots, 4-5 passengers, 200 h.p. "Whirlwind" engine, 118 m.p.h.

Fokker Super-Universal, 2 pilots, 6 passengers, 400 h.p. "Wasp" engine, 140 m.p.h.

Fokkers *Serve* Throughout the World

SERVICE, in an airplane, is derived from the design, workmanship and materials which have gone into its making. To the combination of these elements in Fokker Aircraft, their sweeping success in giving *service* under the most arduous conditions is due.

As a striking illustration, here is one out of hundreds of instances:

Lt. Koppen blazed a mail route from Amsterdam to Batavia and back, in a Fokker Trimotor. Without relief, Koppen and his crew of two made it in 10 *elapsed days going, and* 12 *returning. Flying days: 9 out, and* 10 *home. Total distance,* 17,091 *miles. Average miles per flying day,* 900. *Actual flying time,* 153½ *hours.*

Perhaps no long-distance flight was ever crowded with such vicissitudes, discouragements and natural handicaps. Again and again Koppen was caught in dense fogs, violent tropical sand and rain storms. Most of the way he flew over wastelands, jungles, mountains, extremely hazardous terrain, and treacherous water jumps. He chose to fly blind through storms rather than risk landing in unknown territory. Several times Koppen in making the best of primitive landing fields became unavoidably mired. In Siam, a crowd of volunteers, pulling the Trimotor from the mud, innocently broke a landing gear strut, dropping the right wing to the ground.

The flying qualities of the Fokker Trimotor carried it to success through almost impossible flying conditions. Its natural stability insured safety even when flying blind. Where beset by mishap, repairs were made promptly, without special tools or workers, thanks to the simple materials used in every Fokker.

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AIR COMMERCE REGULATIONS

Department of Commerce Aeronautics Branch

Effective as Amended June 1, 1928

Chapter 1. LICENSING OF AIRCRAFT

SECTION 1. Licensing Law.

"'Air commerce' means transportation in whole or in part by aircraft of persons or property for hire, navigation of aircraft in furtherance of a business, or navigation of aircraft from one place to another for operation in the conduct of a business." (Sec. 1, air commerce act of 1926.)

"'Interstate or foreign air commerce' means air commerce between any State, Territory, or possession, or the District of Columbia, and any place outside thereof; or between points within the same State, Territory, or possession, or the District of Columbia, but through the air space over any place outside thereof, or wholly within the air space over any Territory or possession, or the District of Columbia." (Sec. 1.)

*"The Secretary of Commerce shall, by regulation * * * provide for the granting of registration to aircraft eligible for registration, if the owner requests such registration * * *."* (Sec. 3 (a).)

*"It shall be unlawful * * * to navigate any aircraft * * * in interstate or foreign air commerce unless such aircraft is registered as an aircraft of the United States."* (Sec. 11 (a) (2).)

*"To navigate any aircraft registered as an aircraft of the United States * * * without an aircraft certificate, or in violation of the terms of any such certificate."* (Sec. 11 (a) (3).)

"Any person who (1) *violates any provision of subdivision (a) of this section * * * shall be subject to a civil penalty of* $500 ** * *."* (Sec. 11 (b).)

Aircraft means "any contrivance now known or hereafter invented, used, or designed for navigation of or flight in the air, except a parachute or other contrivance designed for such navigation but used primarily as safety equipment." (Sec. 9 (c).)

Aircraft of the United States means "any aircraft registered" under the air commerce act. (Sec. 9 (f).)

Sec. 2. Application of the Law.

Aircraft must be licensed before engaging in—

(*A*) *Carrying persons or property for hire, or the United States mails*—

(1) Between two or more States, or to or from foreign countries, as from Chicago to Cleveland, Ohio, or from New York to Portland, Me., to Montreal, Canada.

(2) Between two points in one State if a part of the flight is over another State, as from Buffalo to New York via Susquehanna, Pa.; or from Buffalo, thence over any part of Pennsylvania, and thence back to Buffalo.

(3) Between two points in one State if it is a part of a through carriage between points in different States, or countries, as from Los Angeles to San Francisco, Calif., as a part of the carriage between Los Angeles and Seattle, Wash., or from San Antonio, Tex., to Laredo, Tex., as a part of the carriage between San Antonio and Monterey, Mexico.

(4) Within the air space over the District of Columbia, or any Territory or possession of the United States.

(*B*) *Aircraft used solely for pleasure or non-commercial purposes need not be licensed, although engaged in flying between States*, but, at the option of the owner, may be licensed, in which event it must observe all the requirements of licensed aircraft. *Whether licensed or not, all aircraft must display the assigned identification mark.*

Sec. 3. Aircraft Belonging to the United States.

Aircraft belonging to the United States will be licensed by the Secretary of Commerce if the operating agency so requests.

Sec. 4. Aircraft Belonging to States, etc.

Aircraft belonging to States, Territories, or possessions of the United States, or to political subdivisions thereof, will be licensed by the Secretary of Commerce and rated as to airworthiness in the same manner as other craft if requested for licensing is made and such aircraft are used exclusively in the governmental service.

Sec. 5. Foreign Aircraft.

(*A*) Where civil aircraft of the United States are permitted to fly in or over a foreign country without registration and rating and licensing of their airmen, the aircraft of such foreign country, not a part of its armed forces, and the airmen serving in connection therewith, may operate without a license in the territory over which the United States has jurisdiction. Such foreign aircraft shall not engage in interstate or intrastate air commerce and must observe the air-traffic rules.

(*B*) Aircraft owned by resident aliens will be granted identification marks but shall not engage in interstate or intrastate air commerce.

(*C*) Registered aircraft of the United States shall not be flown or operated in air commerce in the United States or its possessions, by, or in behalf of any individual, partnership, firm, or corporation not eligible to license for such registered aircraft.

Sec. 6. Requisites of Licensing and Registration.

An aircraft, to be entitled to license and registry, must be airworthy and equipped in accordance with requirements of the Secretary of Commerce and owned by—

(*A*) A citizen of the United States and not registered under the laws of any foreign country; or

(*B*) A partnership of which each member is a citizen of the United States; or

(*C*) A corporation organized under the laws of the United States, a State, Territory, or possession of the United States, and of which the president and at least two-thirds of the directors or managing officers are citizens of the United States, and of which at least 51 per cent of the voting interest in the corporation is controlled by citizens of the United States; or

(*D*) The Government of the United States, a State, Territory, or possession, or a political subdivision thereof.

Sec. 7. Registration, Meaning of.

Registration means entry of licensed aircraft in an official license registry of the Secretary of Commerce as aircraft of the United States. Unlicensed aircraft, though entered of record for purposes of identification as required by law, are not registered aircraft within the meaning of these regulations.

Sec. 8. Airworthiness, Law of.

*"The Secretary of Commerce shall by regulation * * * provide for the rating of aircraft of the United States as to their airworthiness * * *. The Secretary may, from time to time, rerate aircraft as to their airworthiness upon the basis of information obtained under this subdivision."* (Sec. 3 (b).)

*"It shall be unlawful * * * to navigate any aircraft registered as an aircraft of the United States without an aircraft certificate or in violation of the terms of any such certificate."* (Sec. 11 (a) (3).)

*"Any person who violates any provision of subdivision (a) of this section * * * shall be subject to a civil penalty of* $500." (Sec. 11 (b).)

Sec. 9. Airworthiness, Meaning of.

Airworthiness means a condition meeting the minimum aircraft requirements as set fortb herein.

Sec. 10. Airworthiness Requirements.

(*A*) AIRWORTHINESS FACTORS.—In determining the airworthiness of airplanes the following factors are taken into consideration:

(1) The structural strength of wings, ailerons, tail surfaces, fuselage including engine mount, fittings, control system, and landing gear, as shown by stress analyses.

(2) Cockpit, cabin, and control arrangements.

(3) Power plant and power-plant installation.

(4) Equipment and instruments.

(5) Propellers.

(6) Design of fittings.

(7) Materials and workmanship.

(8) Flying characteristics and qualities.

Certain of these items may be demonstrated by theoretical analyses and drawings, others hy visual inspection, and others hy tests.

(*B*) LOAD FACTOR REQUIREMENTS.—The load-factor requirements for the structural members of an airplane shall he determined as follows:

(1) *Flying conditions.*—Figure 1 hereof, and hereby made a part of these regulations, shall be used to determine the load factors for the high angle of attack condition of landplanes and float-type seaplanes. Reference shall be made to it and the factor obtained for the appropriate weight and horsepower loading, tbe factors for gross weights which lie between 2,500 and 12,500 pounds heing determined by interpolation between the appropriate curves. For multi-engined airplanes the horsepower to be used for computing the loading in pounds per horsepower shall be that necessary to maintain level flight with full load at sea level. For flying hoats and amphihians of 5,000 pounds gross weight or less the factor for 5,000 pounds shall bc used; for gross weights in excess of 5,000 pounds the factors shall he those indicated by tbe actual weight and power loading.

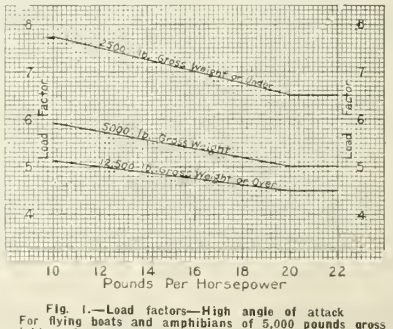


Fig. 1.—Load factors—High angle of attack

For flying boats and amphibians of 5,000 pounds gross weight or less, use the 5,000-pound gross weight factors. Horsepower loading shall be based on rated engine horsepower except that for multi-engined airplanes the horsepower shall be taken as that necessary to maintain level flight with full load.

Note.—It is to be noted that the load factors given in this chart are not sufficiently high to conform to the International requirements throughout the entire range of horsepower loading. Manufacturers designing airplanes for export should take into account the load factors and design requirements of the country to which the airplane is to be exported.

In the low angle of attack condition the load factor shall be 65 per cent of the high angle of attack factor, but in no case less than 3.

For the inverted-flight and nose-dive conditions the load factor shall he 40 per cent of the high angle of attack factor, hut in no case less than 2.

(2) *Landing conditions.*—The load-factor requirements for landing conditions shall be obtained from Table 1. If the landing gear is designed to absorh landing shocks hy the flow of a liquid through an orifice (the oleo or oleo-pneumatic type), the design load factors for the landing gear may he reduced hy not more than 25 per cent from those shown in Tahle 1, but suitable provision shall he made to carry taxiing shocks after tbe absorher has heen forced to the full extent of its travel.

For float seaplanes the floats and the members to which they are attached, including the "carry-through" tuhes in the fuselage, shall he designed for a factor in landing of 8.0.

The shock absorber in the cbassis of a landplane or amphihian shall he designed to absorb the energy generated hy a free drop of tbe airplane from the height specified in Tahle 1 without subjecting the airplane or landing gear to forces greater than those corresponding to the load factors for landing.

The tail-skid shock absorber shall be designed to resist a free drop in the three-point landing attitude equal to that shown in Table 1 without imposing loads on the tail skid or fuselage greater than those corresponding to the load factors for landing.

(3) *Tail surfaces and ailerons.*—Tail surfaces and ailerons shall be designed to withstand the loads specified in Tahle 1.

TABLE 1

Class	Factor for landing conditions	Height of free drop for design of shock absorber (inches)	Loads per square foot on ailerons and horizontal tail surfaces	Vertical tail surfaces
2,500-pound or less..	6.5	24	30	75 per cent of load required on horizontal surfaces.
5,000-pound	5.5	22	25	
12,500-pound	5.0	20	20	
12,500-pound or over	4.5	18	20	

(4) *Seaplane floats and boat hulls.*—Flying-hoat and seaplane-float bottoms shall he designed to withstand, without permanent set, tbe following loads:

(*a*) Eigbt pounds per square inch over that portion of the hull lying hetween the first step and a section 25 per cent of the distance from the step to the how; (*b*) 4 pounds per square inch from that section to a section at 75 per cent of the distance from the step to the bow; (*c*) 4 pounds per square incb between the first and second steps; and (*d*) 4 pounds per square inch between the rear step and a section 50 per cent of the distance to the stern. If but one step is used, this load shall extend over that portion of the hull between the step and a section 50 per cent of the distance from the step to the stern.

The submerged displacement of the main floats shall be at least 190 per cent of the full load of the airplane. Main floats shall be divided into at least five water-tight compartments.

In designing tbe how portion of the hull due attention must be paid to the effect of striking floating objects.

(*C*) CONTROL SYSTEM.—The control system shall be designed to withstand a load of at least 300 pounds in a fore-and-aft direction and 150 pounds in a lateral direction applied at tbe grip on a stick control; on a wheel control it shall withstand at least 300 pounds in a fore-and-aft direction applied at the center of the wheel and a couple equal to 125 pounds times the diameter of the wheel applied tangent to the rim of the wheel. The rudder controls shall he designed to withstand a load of not less than 300 pounds applied at the point of contact witb the foot. On airplanes having a gross weight of 1,000 pounds or less, two-thirds of the ahove values may be used. In any case, the strength of the control system shall he sufficient to withstand loads on the control surfaces 25 per cent greater than those specified in Table 1 for the design of the surfaces. The entire control system shall be so designed that tbe rudder, elevators, ailerons, and other movable parts thereof will not jam, and, if necessary, control stops shall be provided to prevent it.

Dual controls on airplanes carrying passengers for hire shall be so constructed or arranged as to prevent passengers from interfering with the course of flight of the airplane.

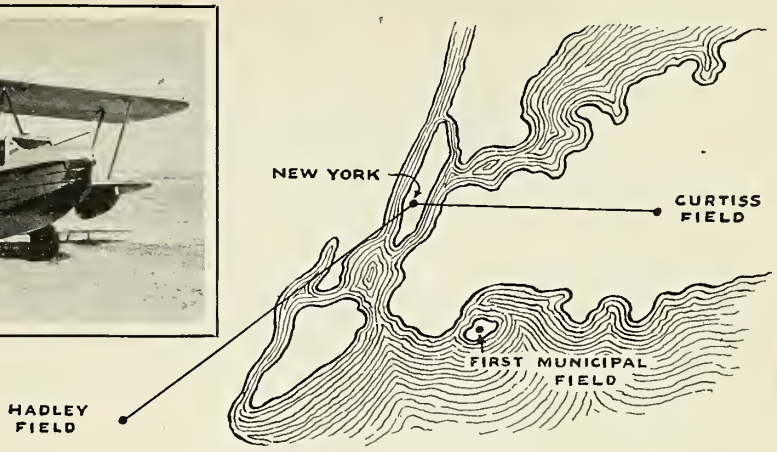
(*D*) CONSTRUCTION OF COCKPIT AND CABIN.—The cockpit or cabin shall he constructed to afford suitahle ventilation, adequate vision to pilot under normal flying requirements, and reasonable protection to pilot and passengers against possible propeller hreakage.

Closed cabins of airplanes carrying passengers for hire shall have not less than two exits, affording maximum ease of operation. One of such exits may he an emergency exit, in whicb case the size, location, and method of operation shall be subject to the approval of tbe Secretary of Commerce.

(*E*) POWER-PLANT REQUIREMENTS. — Engines wbich have passed the regular endurance tests of

(*Continued on page* 948)





From airport to city is where time is lost

Most airports are necessarily removed from the heart of the city. That means delay and traffic congestion getting to and from the flying field. Frequently most of the time gained in flying is lost at the beginning or end of the journey. The same applies to mail and express.

Most large cities are situated on water . . . the ocean, a lake or a river. And that water is usually close to the heart of the city. Rapid transit to airports is still a thing of the distant future and even that will have its drawbacks. The air is the only clear thoroughfare.

To facilitate the transport of passengers, mail or express, operators feel the need of shuttle air lines from airports to the centers of cities. To increase the traffic it is necessary to provide this additional air service. And Amphibians are the only solution.

The Ireland Amphiplane is the only ship of its kind in production. A practical sea and land plane that carries exceptional pay loads and provides comfortable passenger facilities for four besides the pilot . . . either open cockpit or closed cabin.

Fast, efficient, very maneuverable, and safe, the Amphiplane affords more adaptability and service latitude than any ordinary aircraft. The factor of safety in any emergency is not only greater than in any other type of plane but becomes a talking point in air transport operations.

Ireland Amphiplanes have been thoroughly tested in service. There is no guess work about what they can do or stand . . . they are proven aircraft . . . all the "bugs" are out. Deliveries are being made with reasonable promptness.

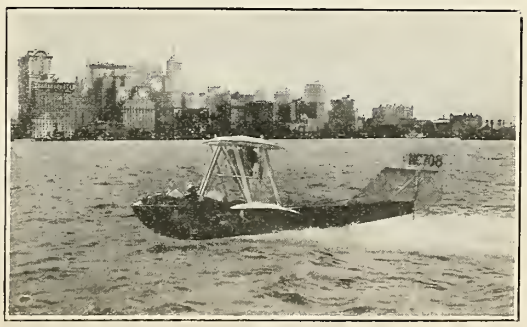
It takes 1½ hours to get from Hadley Field to Penn. Station, New York by rail (35 miles). It requires 1 hour from Curtiss Field (20 miles). It takes longer by motor . . . a tremendous waste of time and great inconvenience. Air traffic is impeded, mail and express are slowed up.

With an Ireland Amphiplane, 4 passengers from Hadley Field can be landed at the Battery or anywhere else on water around Manhattan in about 25 minutes.

Lambert Field is 15 miles from business St. Louis.
Municipal Field is 9 miles from business Chicago.
Ford Airport is 7 miles from business Detroit.
Municipal Field is 8½ miles from business Cleveland.

Ireland Amphiplane

Wright Whirlwind J-5-C, 220 H.P.
Curtiss Reed Propeller, pusher type
Hull and Tail of steel tubing welded
Hull Covering, non-corrosive alclad
High speed, full load, 94 m.p.h.
Cruising speed, loaded, 80 m.p.h.
Landing speed, loaded, 45 m.p.h.
Take-off from water, 30 seconds
Take-off from land, 12 seconds



IRELAND
AMPHIPLANE

Flies in the air, floats on water, taxis on land

Ireland Aircraft, Inc., Curtiss Field, Garden City, N. Y.

the United States Army Air Corps or the United States Navy Bureau of Aeronautics will be approved by the Department of Commerce. Other engines submitted for approval will be tested by the Department of Commerce at the Bureau of Standards.

The log shall include the following:

Piston displacement, compression ratio, type of ignition, carburetor and spark plugs; barometric reading and complete list of instruments and apparatus used for the test. The length of brake arm and gear ratio if propeller is geared shall also be given. The test shall be such as to develop the following data:

(1) A plot of power developed at various revolutions per minute with the throttle wide open.

(2) Record of log showing readings, at approximately 30-minute intervals, of—

(*a*) Revolutions per minute.
(*b*) Brake load in pounds.
(*c*) Oil pressure and temperatures.
(*d*) Water temperatures.
(*e*) Air temperature at carburetor intake.
(*f*) Blast velocity.
(*g*) Maximum cylinder temperature, head and barrel.
(*h*) Manifold depression in inches of mercury.
(*i*) Fuel time in seconds for at least 5 pounds.
(*j*) Oil in pounds.
(*k*) Brake horsepower.
(*l*) Remarks, including breakages and replacements.

The 50-hour endurance test shall he run in 10 five-hour periods. During the first 5 hours the engine shall be run with the throttle wide open, the speed being at least equal to the rated speed and the power being at least 10 per cent in excess of the rated power. During the remaining 45 hours the engine shall be run at approximately rated speed and the horsepower developed should at no time be less than the rated horsepower.

(3) Photographs showing set-up of the testing apparatus used and of any parts which failed or showed excessive wear.

(4) List of instruments and apparatus used.

(5) After completion of the test, and a complete tear down, a report of detailed inspection of engine parts, particular attention to be paid to excessive wear and signs of failure.

An engine, after successfully passing the required block tests, shall be installed in an airplane and given actual service tests.

A newly constructed engine of a type and design which has been tested in accordance with the provisions hereof must not be installed in an airplane until bench tested for at least two hours, during at least one-half hour of which the engine must be run at full throttle.

An engine which has been in storage for more than one year must not be installed in an airplane until it has been reconditioned in accordance with accepted safety practices.

A reconditioned engine must be run for at least 20 minutes at full throttle before it shall be used in propelling registered aircraft carrying persons or property for hire.

(*F*) Power-plant installation.—With water-cooled engine installation a fire wall of terneplate, galvanized steel, asbestos-aluminum combination, or equivalent thereof, shall be installed, insulating the engine section from other parts of the airplane. Aluminum or aluminum-alloy fire walls will be satisfactory for air-cooled engine installations. Openings made in the fire wall to allow the passage of pipes or wires shall be provided with suitable glands or gaskets.

Carburetor air intakes must open outside the cowling and shall be suitably drained. Exhaust manifolds shall be installed outside of cowling unless specifically authorized by the Secretary of Commerce.

Throttle-control and ignition switches on multi-engined airplanes shall be arranged to permit separate and simultaneous control.

Suitable ventilation shall be provided for the engine compartments.

Air-pressure gasoline-feed systems shall not be used without approval of the department.

Airplanes carrying passengers for hire shall have installed an adequate reserve gasoline supply tank, or satisfactory, reliable apparatus for indicating to the pilot a depletion of the gasoline supply.

(*G*) Propellers.—Propellers which satisfy any of the following requirements will be acceptable:

(1) Designs from which a propeller has been flown for 150 hours without failure on an engine of equal or greater power than that for which the approved rating is sought. Affidavit specifying the number of hours of satisfactory service on a given engine and aircraft, the name of the operator, operating firm, and other pertinent data shall be forwarded to the Secretary of Commerce, together with detailed drawings of the propeller.

(2) Designs which embody only minor modifications from propellers accepted and used by the United States Army or Navy, the contractor to state specifically the departure, if any, from Government design.

(3) Designs which are approved designs, cut down to smaller diameters without reduction of the maximum ordinates, except in the immediate neighborhood of the tip.

Propellers not in accordance with the foregoing shall be tested in the manner prescribed by the Secretary of Commerce.

Propellers must have a ground clearance of at least 6 inches when the airplane is in a horizontal position.

On multi-engined airplanes a clearance of at least 1 inch must be provided between the tips of propellers and the fuselage or any part of the structure.

The seats shall be so arranged that pilots and passengers are more than 12 inches forward or aft of the propeller disks. Surfaces near the propeller tips must be suitably stiffened against vibration.

(*H*) Performance requirements.—(1) The following flight tests with the design gross load shall be required:

(*a*) General flight, which includes a half-hour flight test with full load, to determine stability.

(*b*) General maneuverability, which includes, among other things, a flight with full load around two pylons or buoys, 1,500 feet apart, making five successive figure 8's at 1,000 feet without varying more than 200 feet in height in a radius not to exceed the following:

Five hundred feet for airplanes of full load not in excess of 5,000 pounds.

Seven hundred and fifty feet for airplanes of full load over 5,000 pounds and not in excess of 12,500 pounds.

One thousand feet for all other airplanes.

(2) The landing speed shall not exceed 60 miles per hour when the airplane is provided with a braking device, or 50 miles per hour when not so provided. Landing speed may be assumed equal to the calculated stalling speed. If the foregoing landing speeds are exceeded, the following flight tests with full load sball be required:

(*a*) Take-off within 1,500 feet.

(*b*) Climb at least 250 feet the first minute after taking off.

(*c*) Land, coming to a full stop without external aid, within 1,000 feet from the point where the landing gear first touches the landing area.

(3) Tests are to be calculated upon the basis of air of a specific weight of 0.07635 and still-air conditions.

(4) The applicant must provide the person to make the flight tests, but an inspector from the Department of Commerce may pilot the airplane during such parts of the tests as may be deemed necessary.

(5) No persons other than the crew necessary to conduct the flight shall be carried during performance tests. Sand or similar ballast shall be carried as a substitute for the passengers or cargo ordinarily carried as pay load.

(*I*) Equipment and instrument requirements.—The equipment and instruments required, which must be serviceable and in operating conditions, are:

(1) *Equipment.*—(*a*) Fire-extinguishing equipment, of design approved by the Secretary of Commerce. Cabin airplanes carrying passengers for hire must be equipped with at least one portable extinguisher accessible to the passengers.

(*b*) First-aid kits on airplanes carrying passengers for hire.

(*c*) Safety belts or equivalent apparatus for pilots and passengers in open-cockpit airplanes carrying passengers for hire. Seats or chairs in cabin planes shall be firmly secured in place.

(*d*) Electrical equipment and installation must be approved by the Secretary of Commerce.

(2) *Instruments.*—(*a*) Tachometer for each engine.

(*b*) Oil-pressure gauge where oil-pressure systems are employed.

(*c*) Water thermometer for water-cooled engines and oil thermometer for air-cooled engines.

(*d*) Altimeter.

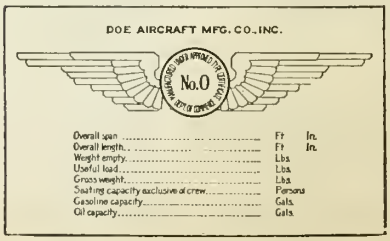
(3) *Compass requirements.*—An airplane flying cross country 100 or more miles and an airplane, including a seaplane, operating over large bodies of water beyond the sight of land must be equipped with a compass.

(*J*) Manufacturer's identification data.—(1) The date of manufacture or date of remodeling and the name of the manufacturer or remodeler, together with the manufacturer's serial number and type of engine, must be permanently affixed in a visible location by means of a metal plate in the pilot's cockpit or compartment, of each airplane, in order that it may be distinguished from all other aircraft.

(2) The following specifications shall be stenciled or otherwise displayed on the outside of the fuselage or cabin at a point adjacent to the entrance into the cockpit or cabin in such manner as to be readily visible to persons proposing to enter the same: Over-all span; over-all length; weigbt empty; useful load; gross weight; seating capacity, exclusive of crew; gasoline capacity; oil capacity.

(3) Upon airplanes manufactured under an approved type certificate the manufacturer tbereof may display tbe insignia shown berewith, in conjunction with the above data required to be stenciled on the airplane.

The insignia, if used, shall be 16 inches in width and 3 inches in height and shall be identical with that shown except that the name of the manufacturer shall appear above it in the manner indicated, and the number of the approved type certificate under which the identical airplane was manufactured shall appear in the circle thereof. The stenciled data shall appear under it in the manner and proportion shown. This insignia shall only be used on airplanes for which application for license has been made, or for which license has been issued, and must be obliterated in the event the airplane is subsequently disapproved for license.



Manufacturer's identification plate

Sec. 11. Approved Type Certificate, Requirements for:

(*A*) Application.—A manufacturer of airplanes, engines, or propellers in quantities and of an exact similarity of type, structure, materials, assembly, and workmanship may, at the option of the manufacturer, file with the Secretary of Commerce an application under oath for an approved type certificate accompanied by the data specified, in duplicate. The design or test data must bear the signature of the responsible engineer.

(*B*) Airplanes.—In order to represent the structure of an airplane satisfactorily the data submitted shall include—

(1) A general assembly drawing of each wing, with the sizes and locations of spars, drag struts, drag wires, leading edge, trailing edge, and members supporting the ailerons and controls clearly indicated.

(2) Drawings of a typical rib, showing method of attachment to the spars and leading edge.

(3) Line diagrams of the external wing bracing, showing truss dimensions, sizes of struts, and wires.

(4) Layout of the fuselage structure, showing sizes of all members of the primary structure.

(5) Drawings of the tail surfaces, showing sizes of spars, torque tubes, internal and external braces, location of hinges, and masts.

(6) Chassis drawings giving a layout of the landing gear tbat shows sizes of struts, axle, bracing wires, shock-absorber spindles, spreader tubes, and other important members and the method of connecting them. Drawings of the tail skid, showing the skid, its connection to tbe main fuselage structure, and the method of steering it, if any.

(7) For seaplanes, drawings of the floats, showing their lines, general dimensions, and a layout showing sizes of struts and wires and method of attachment to the fuselage.

(8) Detail drawings of the mechanisms used to adjust the stabilizer, fin, wing flaps, or similar surfaces while in flight.

(9) Drawings showing the main wing fittings and the control system are required. The analyses must cover the investigation of the strength of the main members of the wings, tail surfaces, landing gear, including tail skids, fuselage, fittings, and control systems for the load factors required in section 10. The analysis of secondary members carrying heavy loads and the investigation of main members subjected to eccentric loads are required.

(10) Stress analysis of tbe control surfaces and control systems may be supplanted by tests made on these units, assembled as in flight, if tbe tests show that the unit will carry 125 per cent of the design load, and if the stick, rudder bar, etc., withstand the loads specified in section 10 (*C*).

(11) The stress analysis shall state the material used for members, whether or not it is heat-treated, and what physical properties are guaranteed, not assumed, by the manufacturer. If metal members of special design are used, test data showing their strength properties under loads similar to those to which they will be subjected in the structure must be submitted.

(*C*) Engines.—Data on engines, showing that the requirements of section 10 (*E*) and (*F*) have been complied with, and a complete set of drawings, must be submitted in duplicate by the engine manufacturer when applying for an approved type certificate.

(*D*) Propellers.—Data on propellers, specified in section 10 (*G*), and a complete set of drawings must be submitted in duplicate by the propeller manufacturer when applying for an approved type of certificate.

(*E*) Inspection and flight tests of airplanes.—If the submitted design is approved and the aircraft meets the requirements stated herein, it will be inspected for exact similarity with the submitted design and specifications. Upon passing such inspection, the airplane must undergo the flight tests prescribed in section 10 (*H*). If such tests are passed, an approved type certificate will be issued to the manufacturer.

(*F*) Construction under approved type certificate.—The approved type certificate will be issued upon the condition that each quarter the manufacturer will file his affidavit with the Secretary of Commerce, showing the number of airplanes, engines, or propellers constructed nnder the approved type certificate during the quarter, with a statement that no airplane, engine, or propeller is being constructed, under such certificate, deviating from tbe terms thereof.

(*G*) Changes.—Changes in airplanes constructed under an approved type certificate are permissible, with the approval of the Secretary of Commerce.

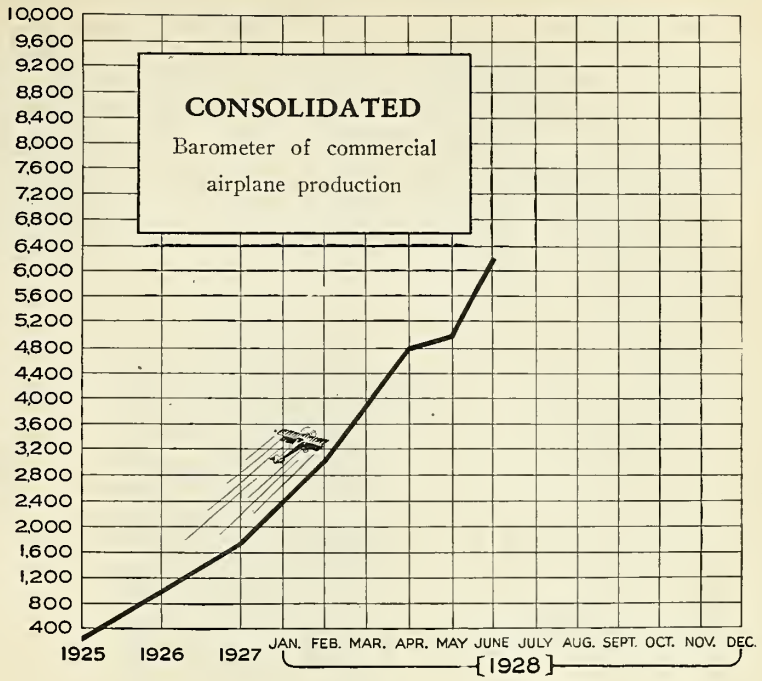
(*H*) Manufacturer's affidavit.—Upon the sale by tbe manufacturer of airplanes of an exact similarity of type, structure, materials, assembly, and workmanship with the specimen for which the approved type certificate is issued, the manufacturer may deliver to the purchaser a manufacturer's affidavit, copies of which will be furnished the manufacturer upon request.

Sec. 12. Application for Aircraft License.

Before an aircraft license will be issued, tbe owner must file, under oath, with the Secretary

(*Continued on page* 950)

The accompanying chart visualizes the constant growth of airplane production . . . and the present approximate rate of manufacture (planes per 12-month period) . . . as indicated by the current delivery schedule of Consolidated Instruments.



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of Commerce, an application for the license upon blanks provided by the Secretary of Commerce. Copies thereof will he forwarded upon request.

Sec. 13. Licensing and Expediting the Licensing of Approved Type Airplanes.

(A) For the purpose of expediting the licensing of airplanes constructed under approved type certificates and in the original possession of the manufacturer or dealer, the following provisions may be invoked, at the option of the manufacturer or dealer. The manufacturer or dealer may present the manufacturer's affidavit showing that the aircraft is exactly similar to the specimen of the approved type and have the airplane flight tested. If the flight tests prescribed in section 10 are passed and the aircraft inspector finds that the airplane is exactly similar to the specimen, a flight certificate will be issued for such airplane, good for 90 days after date and renewable for 90-day periods upon findings of the Secretary of Commerce that the airplane is in substantially the same condition as when the original certificate was issued. The manufacturer's affidavit and the flight certificate may be delivered to any purchaser and will be given such effect as is provided therefor in paragraph (B) of this section.

(B) An airplane constructed under an approved type certificate and in the possession of and owned by an eligible owner of aircraft of the United States will be licensed as follows:

(1) If the application is accompanied by the manufacturer's affidavit, the airplane will be inspected for similarity to the specimen and will be given the flight tests prescribed in section 10. If such inspections and tests are passed and the airplane is found to be equipped as required by these regulations, it will be licensed.

(2) If the application is accompanied by both the manufacturer's affidavit and a valid flight certificate, it will be licensed if found to be equipped as required by these regulations.

(3) If the application is not accompanied by the manufacturer's affidavit and the flight certificate, it will he licensed under the provision of section 14 hereof.

Sec. 14. Licensing of Airplanes not Constructed under Approved Type Certificates.

(A) For an airplane constructed after October 1, 1927, and not manufactured under approved type certificate, the application for the license must be accompanied by the information specified in the requirements for approved type certificate.

(B) *Tests.*—(1) For an airplane constructed after October 1, 1927, in conformity to the airworthiness requirements of these regulations and which passes the flight tests specified in section 10, an aircraft license will be issued by the Secretary of Commerce.

(2) For airplanes constructed prior to October 1, 1927, and found by the Secretary of Commerce to be of proper design, assembly, and workmanship, and of suitable materials and equipped in accordance with these regulations, aircraft licenses will be issued after such airplanes have passed the flight tests specified in section 10.

Sec. 15. Licensing of Special Classes of Airplanes.

Racing and experimental airplanes and airplanes of unusual design will be granted special aircraft licenses, and other aircraft may be specially licensed for other purposes and shall be operated only in accordance with the conditions specified in such licenses.

Sec. 16. Places for Airworthiness Tests.

The Secretary of Commerce will fix the time and place for all inspections and tests for airworthiness.

Sec. 17. Licenses—Contents.

Aircraft licenses will be issued for a period of not exceeding one year and will identify the airplane, specify the authorized type of the engine and the authorized gross weight, and will be granted subject to compliance with these regulations.

Sec. 18. Sale of Licensed Aircraft.

On the date of sale or transfer of title of licensed aircraft the vendor shall report in writing to the Secretary of Commerce the date and place of sale or transfer, and the name and residence of the vendee and on said date return to the Secretary of Commerce the aircraft license and the metal plate furnished by the Secretary of Commerce.

If the sale is to an ineligible owner of aircraft of the United States, the aircraft license terminates as of the date of such sale. If the vendee is an eligible owner, he is responsible for filing with the Secretary of Commerce a properly executed purchaser's renewable application, if such vendee desires to have the aircraft licensed in his name for the unexpired term of said license. In the event the vendee does not elect to have the aircraft relicensed or is not an eligible owner, application, in duplicate, for identification mark shall be made to the Secretary of Commerce. In such case the vendee shall cause to be removed or obliterated from the aircraft the letter or letters which precede the license numeral or numerals.

The vendee, i.e., an eligible owner of licensed aircraft, may, under the license number already assigned, operate the aircraft for a period of 20 days from the date of mailing the application or delivering the same in person to the Secretary of Commerce. In no case shall this period extend beyond 30 days from the date of sale. In all cases the vendee must attach to his application the bill of sale or a certified copy thereof.

Between the date of sale and the posting in the mails or delivery in person to an authorized representative of the Secretary of Commerce of the purchaser's renewable application or application for identification mark the aircraft is considered unlicensed and unidentified, and the operation thereof constitutes a violation of these regulations.

Sec. 19. Relicensing of Aircraft.

Upon the expiration of the term of an existing aircraft license the aircraft will be relicensed for additional periods of not exceeding one year upon the application of the licensed owner for relicensing and the finding of the Secretary of Commerce that the aircraft is airworthy and is owned by an eligible owner.

Sec. 20. Display and Surrender of License.

The aircraft license must be carried in the aircraft whenever it is in service and must be conspicuously posted where it may be readily seen by passengers or inspectors. Whenever the craft is unairworthy the license must be removed from the craft, and when the license is suspended or revoked, or when it is no longer in force, it shall be surrendered to the Secretary of Commerce. The license must be presented for inspection upon the demand of any passenger or of any authorized official or employee of the Department of Commerce or State or municipal officials charged with enforcing local regulations or laws involving Federal compliance.

Sec. 21. Licensing of Airships and Balloons.

Until otherwise provided by regulations, the licensing of airships and balloons shall be in accordance with special orders of the Secretary of Commerce.

Sec. 22. Meaning of Airplane.

Except as otherwise specifically shown, the word "airplane" as used in this chapter includes seaplane, or any combination of landplane, seaplane, or boat.

Sec. 23. Canceling Licenses upon Request.

Upon the request of the licensed owner the aircraft license will be canceled hy the Secretary of Commerce.

Sec. 24. Revocation of Suspension of Licenses—Law.

*"The Secretary of Commerce shall by regulation * * * provide for the * * * suspension and revocation of registration (and) aircraft certificates."* (*Sec.* 3 (*f*).)

Sec. 25. Ground for Revocation or Suspension.

Aircraft licenses will be suspended or revoked for—

(A) Violating the air commerce act or any of these regulations.

(B) Failing to make proper and seasonable reports.

(C) Making false statement in application or information accompanying the application for the license, or in any report required under these regulations.

(D) Equipping the airplane with a type of engine not specified in the license or approved by the Secretary of Commerce.

(E) Remodeling the engine and using it to propel licensed aircraft without the aircraft having been first rerated as airworthy by the Secretary of Commerce.

(F) Remodeling the airplane structure and flying the airplane without having it first rerated as airworthy by the Secretary of Commerce.

(G) Operating the airplane in excess of the authorized useful load specified in the license.

(H) Operating with passengers in excess of the original designed seating arrangement. Infants under 2 years of age are excepted, providing the maximum allowable useful load is not exceeded.

(I) Using or displaying license for fraudulent purposes.

(J) Using or displaying license in any manner contrary to the public safety or interest.

Chapter 2. INSPECTION OF AIRCRAFT

Sec. 26. Continuous Duty as to Flying Condition.

After an aircraft is licensed, and between the times that it is inspected for airworthiness by an inspector, the owner is charged with the continuous duty of maintaining the aircraft in a good and proper state of repair and flying condition. For violation of this duty or of the inspections required in the next succeeding section the aircraft license will be suspended or revoked.

Sec. 27. Daily and Periodic Inspections.

(A) A licensed airplane shall be given a line inspection by the owner or a licensed mechanic at least once within each 24 hours preceding flight, and the result thereof shall be entered in the log under the signature of the person making such inspection. The line inspection must be made to ascertain the working condition of state of repair of the—

(1) Open control wires, all control wires and pulleys open to inspection through apertures, and all hinges on control surfaces.

(2) Landing gear, wheels, fittings, and shock absorbers.

(3) Fuselage parts open to visual inspection.

(4) Main plane external bracing, including fittings and struts, external wires, cables, turnbuckles, and fabric or covering.

(5) Control surface fabric or covering.

(6) Engine-exbaust manifolds and exhaust-pipe extensions. The engine sball be given a warming-up test, during which the proper functioning of the engine instruments shall be ascertained.

(7) Carburetors and fuel-feed lines open to visual inspection to insure proper functioning.

(8) Cooling system and connctions.

(9) Cowling, to insure that the cowlings are properly secured and safetied.

(10) Propellers, as to condition.

(B) After each 100 hours of flight, in addition to the line inspection, the airplane must be given a "periodic inspection" by the owner, and the result thereof must be entered in the log by the person making sucb inspection. This inspection must be made to ascertain the working condition and state of repair of the—

(1) Engine installation.

(2) Control systems throughout.

(3) Propeller alignment.

(4) Fuselage, including fittings, tail skid, and tail-skid shock absorbers.

Sec. 28. Government Inspections.

The inspector or other authorized officer of the Secretary of Commerce shall be permitted by the owner or operator to inspect the licensed aircraft at any time and place for the purpose of determining its flying condition and state of repair. For such purposes the owner or operator shall give to such inspector or officer free and uninterrupted access to the aircraft and the field or shelter where the craft is located.

Chapter 3. OPERATION OF AIRCRAFT

Sec. 29. Solo Flights with Passenger Planes.

In addition to the requirements of section 10 (E), licensed airplanes with newly installed engines, old, new, or reconditioned, and airplanes upon which major repairs have been made to the plane structure, must be first test flown by a licensed pilot without passengers for hire.

Sec. 30. Carrying Passengers at Night.

Licensed aircraft, when engaged in carrying passengers for hire any time between one-half hour after sunsct and one-half hour before sunrise, must be equipped with electric landing lights and navigation lights.

Sec. 31. Supplies and Equipment for Flights over Water.

An airplane flying over large bodies of water must be provided with an adequate supply of food and potable water, and, if engaged in carrying passengers for hire, it must be equipped with a Very's pistol or approved equivalent and life preservers or other flotation devices approved hy the Secretary of Commerce.

Sec. 32. Repairs after Accident Reports.

After repairs have been made on a licensed aircraft which has been seriously damaged, the licensed owner shall make full report to the Secretary of Commerce of the kind and extent of repairs made to the craft.

Sec. 33. Flying Seriously Damaged Airplanes.

A licensed airplanc which is seriously damaged must not be flown with passengers for hire until it has been fully repaired and its flying condition approved by an inspector.

Sec. 34. Accident Reports.

Where serious injury to person or property is suffered or death results in operating licensed aircraft, the owner of such aircraft shall immediately report, by telegraph or telephone, to the Secretary of Commerce, the license number or identification number of the aircraft and the time and place of the accident. All accidents in the operation of licensed aircraft which result in injury to the aircraft shall be reported without delay on the form provided for that purpose.

Sec. 35. Logs and Navigation Reports.

The owner or operator of every licensed aircraft shall keep a navigation and engine log book and shall quarterly transmit to the Secretary of Commerce a navigation summary report, in duplicate, showing the number of hours and the approximate number of miles the aircraft has been flown during the quarter, the duration of the use of each engine, the engine installation and repairs, and the plane structure and rigging changes and repairs.

The log books shall be carried in the aircraft at all times when such aircraft is away from its home airport.

Sec. 36. Foreign Air Commerce.

Until otherwise provided, the laws of the United States and regulations made thereunder with respect to the entry and clearance of vessels engaged in foreign commerce are hereby made applicable to aircraft engaged in foreign air commerce.

(The Air Commerce Regulations will be continued in the July issue.)

BLACK & BIGELOW, INC.

A NEW organization to render engineering and business services to aircraft operators, manufacturers and others interested in aviation has been started by Archibald Black and Anson A. Bigelow.

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The services offered by Black & Bigelow, Inc., include not merely engineering but also such work as traffic development, organization of flying operations, accounting and advertising. The organization includes a group of specialists each with an established reputation in his particular activity.

The New B.B.T.
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INTERMEDIATE AIR-MAIL TYPE

Projects an intense low beam of light over 180 degrees.

Light source is a 5-kw incandescent lamp.

The B.B.T. Fresnel Lens is but one of its many features.

It produces a sharp cut off and illuminates an area 2000 feet in length and 1000 feet in depth in which safe night landings can be made.

Economical both in initial cost and maintenance.

Further information with complete aviation lighting catalog gladly furnished on request

B.B.T. CORPORATION OF AMERICA

ATLANTIC BUILDING PHILADELPHIA PENNA.

PERSONAIRLITIES



by Caldwell

PILOT R. B. LEVISEE who flies for the Boeing Air Transport and lives in Concord, California, says: "No news of my own, but a load on my chest, so here it is: Several times of late daily papers have quoted apparent authority for the statement, '80% of accidents are caused by lack of judgment on the part of the pilot.' Bare as this statement is it leaves a decidedly erratic impression, even though it may be well meant. It is founded on study of the books, not the air. It is based on the minor accidents which happen in every-day walks of life, which no effort can avoid; only chance can help out in theeir happenings.

"By personal contact, not records or books, I can place the cause of nearly all serious cracks to hurry and false economy, trying to save time, work, and money. Taking a chance that certain work or conditions will hold out for a day or trip longer brings grief sooner or later. Never let an unfinished job get outside the hangar door—that's good insurance against serious accidents. The element of chance in nature cannot be removed and must be met. Chance in mechanics can be met and overcome."

Well, R. B., I agree with every word you say about care in looking after planes and any other conditions. But if you would take the blame for at least 50% of the crashes from the shoulders of the pilot, I cannot agree with you. I don't know what the latest statistics are, and I don't care, for somebody has said that there are lies, damn lies, and statistics. But I am convinced that, roughly, half of the crashes are pilot faults. In the first place, if the pilot takes up a plane that isn't as nearly perfect as it can be, he is in fault right there. He has gone up asking something to happen to him. There aren't many owners, individual or corporation, that want a pilot to fly a plane that isn't right. And if they do, they're not worth working for—the pilot is better off on the ground hunting for a decent job with somebody else. I believe that half the crashes start to happen before the ship leaves the ground, but I also believe that it's squarely up to the pilot to know it, and not leave the ground until everything—motor, airplane, weather, and general conditions—are right.

From the daily papers of the past month it appeared that more than 50% of the deaths were due to pilots' errors. There were contributing causes, true. But the pilot erred. Two men went up with makeshift bombs to explode in the air; they exploded in the plane. A pilot errs in attempting such things. Two young girls persuaded a pilot to take them up against his own better judgment in bad weather; the girls were killed when the plane, flying low in clouds, struck a high-tension wire. Two men left New York in a land plane to fly over an ocean liner out at sea; they have not returned. Perhaps the engine failed, but just the same it was a pilot's error that flew a land plane out over the water. Another plane proceeding down the coast was forced to land a mile out at sea—but what was it doing a mile out at sea when it had a flat beach below? A pilot is killed when his rotary-engined plane dives into the ground. But why is he aviating behind a wretched old rotary at this day and date?

When a man kills himself through his own errors, we don't like to say out loud that he has done so. It seems like unkindness. But if we are to achieve the ultimate in safety, we must find the true reasons for these accidents, and educate pilots to avoid them. I'd like to hear some other pilot's opinions on this point, for it's a very important one. To-day the greatest obstacles that aviation has to overcome is fear in the mind of the public—yet the daily paper offers accident after accident, most of them avoidable, that stress further the dangers of flight. These accidents have got to be cut down; and I say again, that I believe that fully half of them are caused by errors in judgment on the part of the pilot, either in the air or on the ground before he started.



Ovington Saxby Faulding

HERE are three handsome pilots standing out in a field at Santa Barbara, California, waiting for Cecil B. DeMille to come and discover them for the movies. That is, I suppose they are waiting for something like that to happen to them. Isn't that what everyone in Calimoronia is waiting for? From what I read of the State that's what I gather, anyhow. These three flying Barrymores in the rough are Earle Ovington, Bert Saxby, and Dwight Faulding. Airmen all! See the helmets and goggles? And Faulding has the peak of his helmet pulled down to keep the vigorous California sun out of his eyes.

Smiling pleasantly in the center we have with us Dr. J. Bert Saxby Jr., otherwise known as Bert, who has just taken delivery on a Whirlwind Travel Air which Earle Ovington sold to him. The Travel Air was apparently up when this picture was taken, or else it got shoved out of the way by the extremely dapper Jennie which you see crouching behind the boys. Bert is Secretary and Treasurer, Santa Barbara Aero Club, though his duties as Treasurer are not tiring.

Dwight Faulding, owner of the Faulding Hotel in Santa Barbara, is the bird on the right. The contented look on his face is due to the fact that he has just sold his Crate, known as the Curtiss Primary Training plane during the late crisis of ten years ago. Outside of the fact that he should have set fire to it instead of selling it, he seems all right. He has just got back from an extensive trip to the South Sea Islands, where the girls dance the hula hula and the hooey hooey all day long.

Earle Ovington, the gentleman at the left in the English drinking-suit, has flown airplanes since about 1910, and was appointed first U. S. Air Mail Carrier in 1911 by Postmaster General Hitchcock. In the same year he won the Boston Globe Tri-State Race, $10,000 cash prize, and was the first pilot to fly over the States of Connecticut, New Hampshire, and Rhode Island. Seeing those States from the air so discouraged Earle that he went to California and has stayed there ever since. The only use he has for an Easterner is to sell him California real estate.

LOUIS MEISTER relieves himself of the following pertinent comment: "Where do these pilots get the thousands of hours' flying time which they claim? There are only 24 hours in a day, and one need not use a slip-stick, but just an ordinary pencil and paper, to show that some of them claim to have been flying ever since they cut their first teeth."

It may be too harsh to say that all men are liars—probably no more than 99% are. The other one per cent are merely exaggerators. It is natural instinct to make the most of our accomplishments and the least of our failures. We all do it, consciously or unconsciously, as a matter of course. The man who prides himself on being truthful is invariably a perverse and stubborn individual. He wants to be different from the majority, that's all. And how can he be more startlingly differen than by being truthful? I find no fault with the liar who claims 5,000 hours when all he has is 500. He is merely following the natural destiny of man in writing up his tiny accomplishments. Besides, what does it matter what a man says about himself? The rest of us immediately discount it, for we know that in all probability he is quite as big a liar as we are. (Cont. on page 954)



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(PersonAIRlities continued)

ANOTHER fuelless motor has been discovered. It was in a Chevrolet, six miles out of town and two miles from a gas station. Reported by C. F. Egge, Executive Secretary of the National Air Pilots Association, from whose private Journal I take the following report on the Pratt and Whitney Hornet, by Pilot E. T. Allen:

"Maybe nobody but myself has as yet had the feel of a 525 horsepower Hornet before him when there is a big load of mail in the pit. But I can tell you it is a comfortable feeling. You ease up to the side of a range of mountains that sticks up about a thousand feet or so above you, open the throttle the other half way, and up you go—1,300 pounds of mail and two husky passengers to boot. And with the snow-locked, so-called emergency fields in their usual winter condition it's a great comfort to know you can get off again if you have to land. You fellows down east maybe don't know what it is like to lift a loaded ship out of an 8,000 foot altitude emergency field with 24 inches of crusted snow all over it. And so far the fields are only about 2,200 feet long in the longest direction. But about this Hornet, so far it's a world beater."

PILOT BOB MOORE of Miami and the Bahama Liquor Islands is going to photograph the interior of Andros Island for the British Government and the Geographic Society of America, who want to know what's in there besides lizards and mosquitos. The island is 110 miles long by some 60 miles wide, and has never been thoroughly explored, even by bootleggers. Bob Moore and Dick Hoit are going to take several hundred shots from a height of 1,000 feet in their Seagull, which they have painted Black and White in honor of the Bimini agent of that precious distillation. What a beautiful color scheme! What a sweet sentiment!

ALTHOUGH I live in New York, I am beginning to think that life must be brighter and better in California. Certainly it holds more variety. There was Roscoe Turner, for instance, who owns the old Sikorsky S. 29. Here in New York it would remain simply the S 29. But out in Movieland what does it become? A German bomber! And Roscoe, trick uniform and all, is now a German bombing pilot, off to bomb London—in the movies. I hope he spares the Savoy Bar—I don't care what else of London he blows up. Roscoe is now a member of that wild band of pilots, of whom Al Wilson and Dick Grace are shining lights, who don't mind crashing airplanes in front of the camera.



Noah Berry and Roscoe Turner



Jack Laass and Lassies

HOLY mackeral! Here's my poor old friend, Pilot Jack Laass among the lassies. Just notice the worried look on the poor old bozo. If ever a pilot was in a dangerous situation, Jack is in one in this picture. Do you notice how he's banking to the right toward that beautiful blond? Reading easily from left to right they are Anne Christy, Sally Eilers, and Flora Bramley of the Wampas Stars, and old man Laass, the one discordant note in a beautiful ensemble grouped before the Ryan plane owned and operated by Mutual Aircraft Corporation.

THIS month's booby prize is awarded to Miss Winifred Brown, first Manchester, England, woman to qualify as a pilot, for her remarkable work in killing a boy and injuring several other children. It may seem slightly ungallant of me to make this award to a young woman, but I do it, not to be mean, but to point out certain aerobatics that must be avoided if the future of aviation is to be free of casualties.

Miss Brown was advertised to alight in a field about 300 yards square, surrounded by an eight-foot wall. She made several attempts to bring her machine down within the enclosure, but each time she was too close to the stone barrier, and had to rise again. Most pilots would have accepted this as a warning that the field was too small. Not Miss Brown. She tried again and again, with maidenly futility, finally landing in the center of the field. Finding it impossible to stop without smashing into the wall, she changed her mind and tried to go up again. But this time she failed to clear the wall. She crashed into it and killed the boy and injured several others. She was unhurt.

Runners-up for the booby prize who hereby receive honorable mention are Harry Smith and a Mr. Chance. Mr. Smith took off cross- and slightly down-wind in a seaplane in Biscayne Bay, from which the plane was fished out after the resulting crash. Mr. Chance took one when he attempted to land his little seaplane cross-wind near Nassau, giving the divers another job. If these two boys keep on and work hard we may be able to award them the prize next month. The trouble with these aerial booby prizes is that some have to be awarded posthumously.

A BRIEF report of the doings of the boys of the West Indian Aerial Express, of Santo Domingo, Haiti, Cuba, Porto Rico, and—if the engine stops—the Atlantic Ocean, as noted down by Chief Pilot Basil Rowe, the old toreador and stamp collector: "Am making this condensed as possible to save space in your waste basket, which I suppose is nearly full. Here's what we all are doing, as we wipe the perspiration from our brows: Dunten is rushing from here to there, and back again. Cal is balancing an anchor on the opposite end of rope which he hasn't wound around his neck. Rowe—fighting the bulls. Wade—trying to create an amendment to the Dominican Constitution. McMickle—trying his best to become accustomed to dusky senoritas and Espagnol. Bailey—trying to understand why all the connecting rods and gagets don't wrap themselves around one another in the belly of the Wright Whirlwind similar to a Dominican Bull Fight. ½ of the Sugar Daddies—watching the sugar cane go in the front end of the mill. The other ½ of the Sugar Daddies—watching the juice come out the rear end of the mill."

Those boys are selling speed in a country where everybody takes a siesta in the afternoon. If the natives buy speed, it's because it is such a contrast to everything else in the place—they just purchase it as a curiosity. I think that's why Pitcairn and Ludington have been so successful selling air rides to the Philadelphians.

JACK GILL of Cleveland has discovered a way to get a bigger kick out of flying. He says, "I sold my Swallow last July and joined the 112th Observation Squadron, Ohio National Guard. I now get a bigger kick out of flying, as I have none of the worries and costs." Jack, if this information ever leaks out, the airplane manufacturers will sue you. I won't tell a soul.

THE Flamingo, the new all-metal six-passenger monoplane introduced by the Halpin Development Co. of Cincinnati, carries an ebony mascot named Benny Smith. He is the first "Aeropotah," and wears a flaming red porter's suit which is as brilliantly colored as the tropical bird after which the ship is named. Charlie Planck, who sends me the photo, wonders if all aerial porters hereafter will be called Benny, after this first one? And was the first Pullman porter named George? I don't know. But I have no doubt that Benny, like George, will say when the plane is nearing its airport, "Shall I bresh yo' off?" And the standard wise-cracking passenger will reply, as he does on the Pullman, "No, don't! I'll just get off myself." Porters may vary, but bum jokes remain the same.



The Aeropotah

(*Continued on page* 956)



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The late Chauncey Redding in his Wright Model B, 1915. (Note strap modestly confining passenger's dress!)

(*PersonAIRlities continued*)

THE gentleman who slightly resembles Mr. Fatty Arbuckle waiting for the jury to come in with the verdict is Major Paulding Edwards, who appears to qualify for membership in the Pioneers of American Aviation, recently formed at Detroit, with Glenn Curtiss and Glenn L. Martin as president and vice-president, respectively. Membership in that association is restricted to those "who were making a living out of aviation in 1916 or prior years and who are still engaged in it, either as designers, builders, pilots, or mechanics." Among those admitted to membership were: Eddie Stinson, Grover C. Loening, Charles A. Day, A. V. Verville, Matty Laird, Chance Vought, Charles H. Colvin, William B. Stout, J. Lansing Callan, W. E. Doherty, Archibald Black, Walter Beech, Floyd Cessna, Ivan R. Gate, Bessie Davis, Beckwith Havens, B. R. J. Hassell, Henry Wacker, James Lamont, Sumner Ireland, Frank Russell, Morris Titterington and Ralph Upson.



Major Edwards

The organizers discussed just what constituted a living in aviation—whether one meal a day would count, or whether three were necessary to qualify. It turned out that if three meals had been declared necessary, not a man there would have qualified, so they compromised on one—which allows Paulding Edwards to slide under the wire as an eligible. I'll send his letter along to Eddie Stinson to pass on his other qualifications, which seem to entitle him to membership.

Edwards first learned the delights of aviation (?) likewise (!!!) in 1916 with Harry Christofferson in a Curtiss Pusher with the intriguing OXX2 motor of blessed memory and rubber valves. In 1917 he organized the California Aviation Corps to train pilots for the U. S. Army, which so discouraged him that he went to Texas as a Major in the Aeronautical Section of the Signal Corps, where he was busily engaged for the duration of the war, washing out Standards equipped with Hall Scott motors. He was personally congratulated on his war service by the Kaiser himself, who referred to him as the American Ludendorff. This so bucked him up that he flew air mail New York to Chicago in 1919, built airplanes in 1920-1922, and organized Valley Air Service Inc. in 1927, and now lives in DeBeque, Colorado.

I'M NOT putting myself up for membership in this Pioneers' Association, because I fail to qualify, in that I didn't earn even one meal a day during the early part of 1915. There was a whole week when I didn't eat at all; in fact, I got to a point where I was tempted to sneak up on the kids at Hampton Beach, N. H., and snatch their ice-cream cones. A man still living—though he is now very old and feeble—who can attest the truth of this starvation statement is Horace Hines, inspector with the Keystone Aircraft Corporation at Bristol. Horace at that time was mechanic for Chauncey Redding, killed in 1915 with Phil Bulman when the old Wright Model B in which they were flying broke up in the air and fell into the Saugus Marsh. That was the plane in which I had my first flight, and in which I almost, but not quite, learned to fly. I continued the painful process, alone and unguided, in my own home-made and rebuilt Curtiss Model B (see picture—and shudder) and finally hurled the awful thing and myself into the waters that leave the shores of Hampton. But perhaps the less said about my early flying exploits the better for my present reputation. I know that I was frequently a terrible disappointment, not only to myself, but to the various country fairs who were insane enough to hire me. My manager, Howard Bushway, became an adept in the nimble art of explaining why airplanes didn't fly, even when they were billed to do so.

THE handsome soldier boy who appears to be advertising the virtues of Pepsodent Toothpaste is no less a personage than Smiling Jack Harding, who had so much trouble with his room and the house detective at the Hotel Statler, Detroit, during the Aircraft Show. The only thing that prevents my detailing this little event in the life of Harding is lack of space—and the rules of the Post Office Department as to what sort of literature shall be carried through the mails. I suggest that you simply walk up to Jack and say, in a menacing tone of voice, "Sir! I am the house detective." Then, if you're not bigger and better than he is, move quickly away from there.



Smiling Jack

Jack signs this picture, which he presented to Frank Tichenor along with a tube of toothpaste, "Yours sincerely 'til we all fly to Heaven with a fuelless motor, Jack Harding."

FAMOUS last words—"I am about to take a flight in a Martin Commercial."



"The Navy regrets that I survived these two perils of 1915."—Cy.



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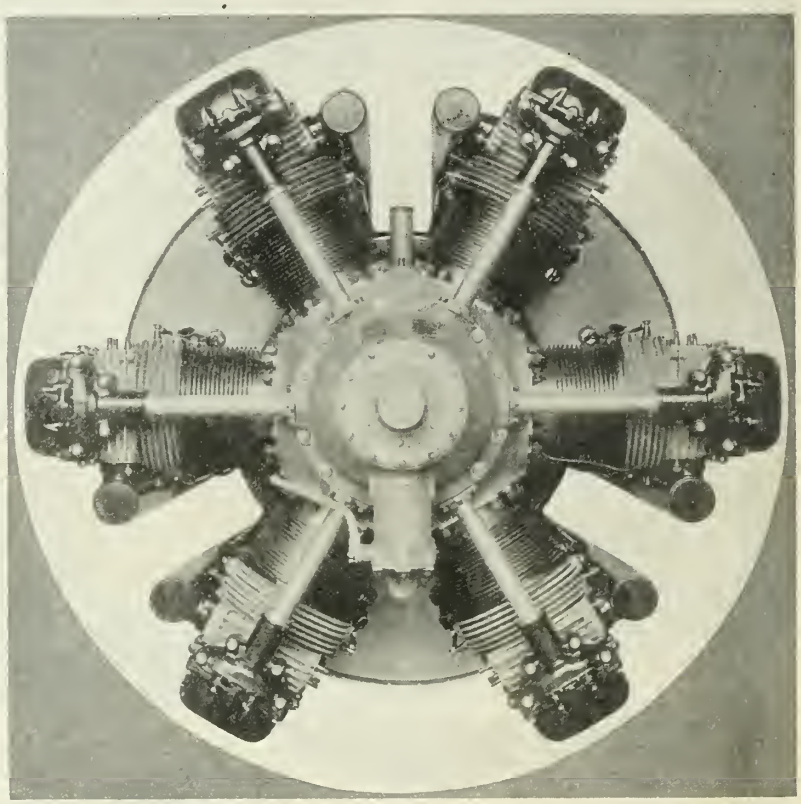
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TECHNICAL

THE CURTISS CHIEFTAIN 600 H. P. AIR COOLED ENGINE



FLIGHT tests were made recently at Mitchel Field, N. Y. on the new 600 H.P. Curtiss "Chieftain", largest air-cooled aircraft engine in this country. Tests were conducted with the engine installed in a two-seater Curtiss Falcon observation and attack plane of the Army Air Corps. The plane was flown by Lieut. E. P. Gaines, Army pilot stationed at the Curtiss factory, and by "Casey" Jones, veteran Curtiss pilot.

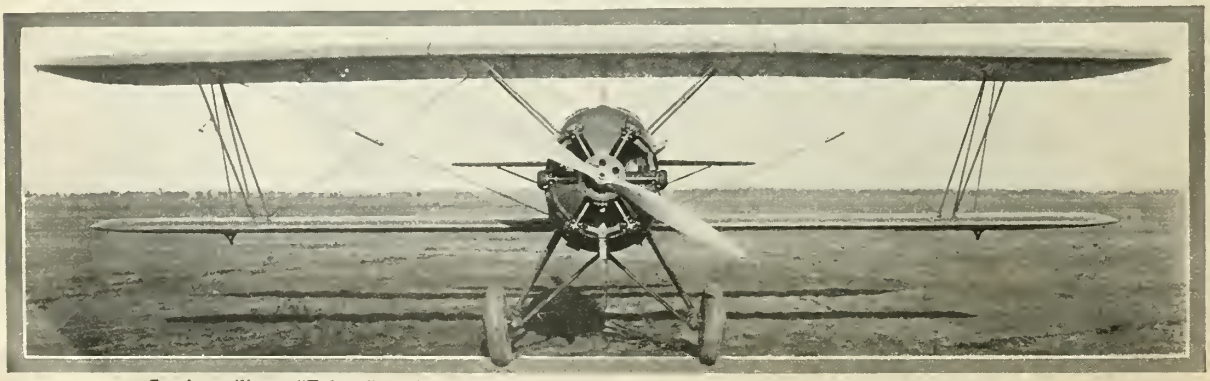
Equipped with the "Chieftain" engine, the "Falcon" showed a top speed of 158 miles an hour, and the service ceiling 22,350 feet, while the initial rate of climb was 1,870 feet per minute.

The excellent speed characteristics of the Chieftain engine is due to its unusual design, which differs from that of any other air-cooled engine. Instead of having one row of cylinders arranged radially as is the common practice, the Chieftain has two rows one behind the other, with 6 cylinders, arranged hexagonally, in each row. This arrangement materially reduces the overall diameter of the engine, thus reducing the head resistance and increasing the high speed. The frontal area per horsepower of the Chieftain engine is approximately one half that of the conventional 9-cylinder air-cooled engine.

The Chieftain engine has been under development by the Curtiss Company for the past two years, with the assistance and guidance of the Air Services. It performed excellently throughout the trials at Mitchel Field, and is soon to be flown to Wright Field, Dayton, Ohio, for Air Corps tests.

The cylinder construction is of the conventional type with the exception that a four valve flat head cylinder is used similar to the water cooled Conqueror engine. Bronze seats are inserted in the aluminum cylinder head and the steel cylinder is screwed in the aluminum head in the usual manner. Each cylinder in a bank has a large pilot on the top end which fits into a casting bridging the two cylinders. This casting is held in place with studs and nuts and carries the double camshaft bearings. The two camshafts on each bank of two cylinders are driven by spur gears at the propeller end, one of these spur gears being mounted on an idler shaft below the two camshafts. The idler shaft is driven through bevels and a master gear on the front end of the crankshaft, all of the vertical shafts being driven from this master gear. Each pair of camshafts has a serrated face coupling for the adjustment of the timing.

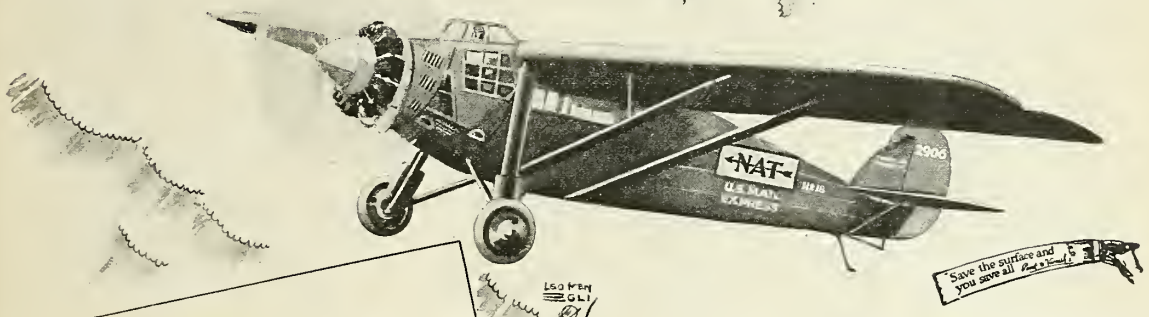
The crankshaft, which is a two throw, 180 degree crank is mounted on two Norma-Hoffmann roller bearings one at each end. The center main steel backed babbitt lined bearing is mounted on a large split circular bearing support which is large enough to clear both crankpins enabling the shaft to be dropped into the crankcase which is of the barrel type. The crankcase is split at right angles to the crankshaft between the two rows of six cylinders being bolted together on inverted flanges on the inside of the crankcase before the cylinders are put in place. This gives a very clean exterior on the crank-



Curtiss military "Falcon" equipped with the new Curtiss "Chieftain" air cooled 12-cylinder engine

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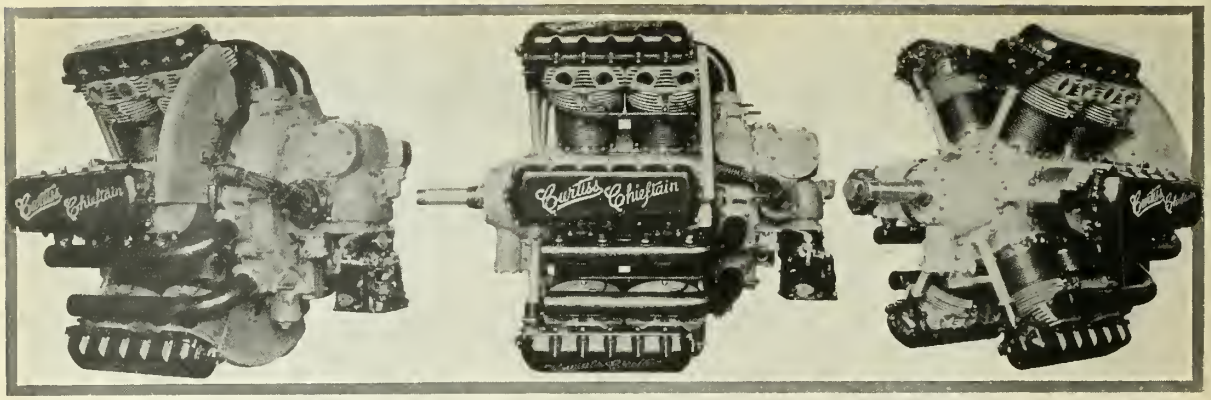
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The 600 h.p. Curtiss "Chieftain", one of the most compact and powerful air-cooled engines

case and the internal flange forms a support for the center main bearings.

The nose piece on this engine contains only the cluster of bevel gears for driving the camshaft, and the oil pressure strainer. The strainer is located at this end of the engine for the purpose of accessibility and permits the use of an oil seal for forcing oil into the crankshaft for lubrication purposes. A large deep groove ball bearing for both radial and thrust purposes is used at the forward end of the nose of the engine on the crankshaft.

The connecting rods are of the split type, very carefully keyed together with integral keys. Owing to the fact that the number of cylinders are even, the rods are perfectly symmetrical permitting the bolts to be placed very close to the babbitt lined bearing shells, thus eliminating the big objection which is always present in a radial engine with an odd number of cylinders in a row. The connecting rod in the single row radial engine must be unsymmetrical making it very hard to get a satisfactory bolting arrangement on the split connecting rod.

Pistons are of the hollow head type and are of the conventional ribbed design which have been used by Curtiss for many years.

The engine is fitted with a rotary inductor or supercharger which will give sea level power at 12,000 feet. It is of the General Electric Company's centrifugal type and is mounted in the rear of the engine being driven by four spur gears, two being on a jackshaft. One main shaft is carried through the defuser of the supercharger to drive all accessories which are mounted on the back of the engine. A very unusual and novel method of mounting accessories has been employed on this engine. All accessories are mounted in such a position that they are accessible when an engine is installed in an airplane.

The starter and magneto are mounted on opposite ends of a horizontal cross shaft driven from very large bevel gears from the shaft which was carried through the defuser. This same shaft through the defuser carries a larger helical gear which drives two vertical shafts in the rear gearcase. Two distributors are driven from helical gears from each of these two shafts, the oil pump being driven off the lower end of one of these shafts and the gasoline pump off the lower end of the other shaft. The generator is mounted in a vertical position, on the top of the gearcase driving through bevel gears. In other words, there are only three bevel gears on the rear end of the engine, driving accessories.

The two gun control drives are taken from the top ends of the two vertical shafts previously mentioned. The tachometer drives are taken from the back ends of the camshaft housings as desired.

The carburetor intake elbow is cast integral with this gear case and a single NA-U8J Stromberg carburetor with economizer control is used.

The standard Curtiss lubricating system is used in this engine with the addition of several features which will be pointed out:

Oil is led from the pressure pump by a steel tube to the pressure oil strainer on the nose of the engine, passing through this strainer to the crankshaft, thence to the two connecting rod bearings and the center main plain bearing. Oil is index fed to all the articulated connecting rod bearings and the leakage from the rods lubricates the cylinder walls and piston pin bushings. Oil under pressure is index fed to all the plain bearings in the gearcase of the engine and also to the ball and roller bearings wherever it has been found necessary. Oil is conducted to the camshaft bearings through the vertical driveshafts and is returned to the main crankcase by gear oil pumps formed by a casing built around the spur gears which drive the camshafts. Therefore, by the addition of a small amount of weight these camshafts spur gears are put to work as oil pumps, keeping the cylinder head covers properly scavenged. Two main scavenging oil pumps are provided, one to take oil from the front end of the engine and the other from the rear end of the engine, returning it to the outside oil tank. Oil thermometer locations are provided.

Characteristics

Horsepower (rated) at 2,200 r.p.m.	600
Model	H-1640
Diameter of engine	45 inches
Diameter of cowling	39 inches
Bore	5⅝ inches
Stroke	5¼ inches
Displacement	1,640 cubic inches
Brake horsepower	615
Fuel consumption (2,000 r.p.m.)	.53 lbs. per b.h.p. per hour
Oil consumption	.020 lbs. per b.h.p. per hour
Weight of engine	900 pounds

AIRPLANE DUCO

THE Paint, Lacquer and Chemicals Department of the du Pont Company has developed a special Duco for airplanes. It was formulated for use over doped fabric surfaces.

The usual method of finishing fabric surfaces on airplanes is to apply four coats of clear nitrate dope by brush. After these four coats are applied and the fabric properly shrunk, it provides a good surface for the specially developed Duco. Three coats of the new Duco are then applied over the surface by spray.

A series of new colors has been developed, made especially for airplane use and aimed to provide the greatest visibility and therefore safety. A scarlet vermilion color has been developed for polar flying. Color specialists working on the subject have decided that this color has the highest visibility in snowy regions of any color in the spectrum.

PRATT AND WHITNEY "HORNETS" AVAILABLE FOR COMMERCIAL USE

THE Pratt & Whitney "Hornet" of 525 h. p. is now available for commercial installation. To date the Navy Department has absorbed the entire production of this type. The Boeing Air Transport Company, which operates the mail route from Chicago to San Francisco, already is employing sixteen "Hornets" in its regular mail service, with a further quantity still on order. The smaller "Wasp" has been used by Boeing Air Transport throughout the last year, but the mail loads have increased at such a rapid rate that it has become necessary to employ the still larger "Hornet."

To date the "Hornets" in the service of Boeing Air Transport have given indication of the same splendid service as obtained from the "Wasp." The first of these engines has already been flown several hundred hours, with entire success.

A number of other "Hornets" have been furnished to various plane designers, including Hamilton, Bellanca, and Ford Motor Company, and new commercial ships around this engine may be expected at an early date.



Years of Experience Make Trustworthy Performance

Waco not only showed the most complete display at the recent Detroit Exposition, but "Old Timers" recall that Waco also showed the most complete display of commercial aircraft at the first Detroit meet back in 1922.

WACO AIRPLANES

ADVANCE AIRCRAFT CO.

Troy, Ohio

TRAVEL AIR TYPE 6000 MONOPLANE

THE new Travel Air Type 6000 was flown by Walter Beech on the seven day All-Kansas Air Tour. Possibly one hundred thousand people at the airports in the 22 cities of this tour saw this new ship. As many crowded inside its cabin for personal inspection as could be accommodated during the brief stop at each airport. The ship created a sensation, not only from the standpoint of performance, but luxurious equipment.

Governor Ben S. Paulen of Kansas was a passenger in this ship throughout the entire tour. Incidentally, the tour encountered all kinds of weather including one of the worst gales that the western country has had for years—heavy rain, soggy landing fields, and poor visibility. The Tour was, however, a decided success.

The landing gear is of the Oleo type and rubber discs are used for absorbing tail skid shock. Wheels, 30 inches by 5 inches with 32 by 6 tires, are provided with Bendix brakes operated by separately controlled foot pedals.

The upholstering of the cabin is blue velour, floor covering thick and soft. Removable wicker chairs. Cabin windows are so arranged that both pilots and all passengers can look out forward. Cabin has two doors, front and rear, at right of ship. Controls are dual "Dep" side-by-side. A heater is provided to keep the temperature at any desired degree, regardless of season or altitude.

The entire construction and appointments of this ship were designed and arranged under the personal direction of Mr. Beech, president of Travel Air Mfg. Company, with full consideration for speed and safety with a maximum of comfort to both pilot and passengers.

This ship was seen at the Ford Airport during the All-American Aircraft Show where demonstrations were given daily.

The power plant is the 200 h.p. Wright Whirlwind J-5C engine.

Fuel is carried in gravity tanks in the wing roots. Capacity 75 gallons. Oil is carried in a tank behind the engine which is removable with the engine mount. Capacity 5½ gallons.

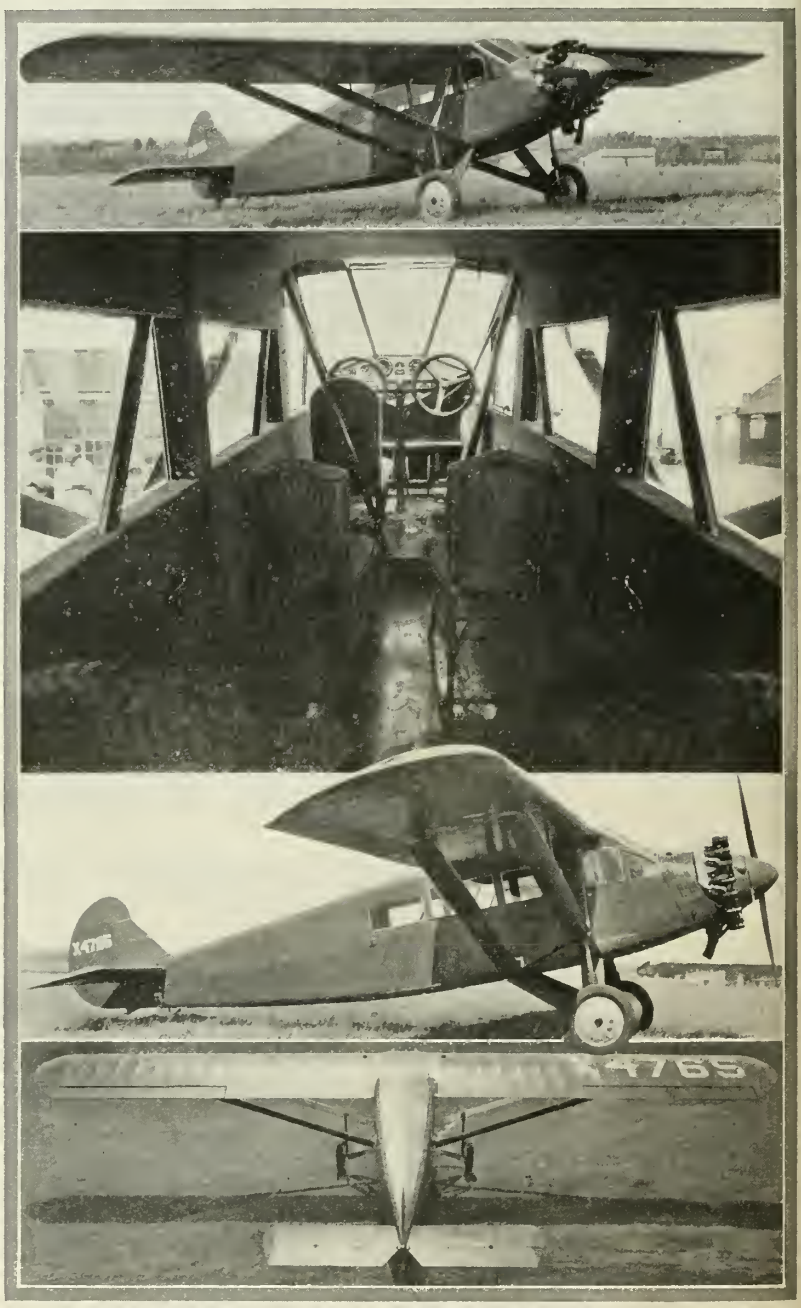
The following instruments are installed: tachometer; oil pressure gauge; oil temperature gauge; magnetic compass; air speed indicator; bank and turn indicator; switch; primer; altimeter.

SPECIFICATIONS—TYPE 6000

Capacity 2 pilots, 4 passengers and 150 pounds of baggage or pilot and 1,000 pounds mail, express, etc.

Performances with Normal Full Load

High speed at sea level..126 miles per hour
Cruising speed at sea level
108 miles per hour
High speed at 10,000 feet..110 miles per hour
Rate of climb at sea level
750 feet per minute
Service ceiling.....15,000 feet
Landing speed.....57 miles per hour
Normal cruising range
(with 78 gallons of fuel)....675-725 miles



Interior and exterior views of the Travel Air passenger plane type 6000

Dimensions

Wing span	48 feet 7 inches
Over all length	30 feet 6 inches
Over all height	9 feet
Wing chord	78 inches
Wing area	282 square feet

Weights

Gross weight	4,000 pounds
Weight empty (fully equipped)	2,350 pounds
Pay load	1,000 pounds
Useful load	1,650 pounds

With a Travel Air transport monoplane E. L. Smith and E. B. Bronte made the 2,340-mile flight from California to Honolulu in 25 hours 36 minutes in July; a Travel Air monoplane was also used by Art Goebel and Lt. William Davis, Jr. who made the same trip in 25 hours and 17 minutes on August 16-17.

The Travel Air Company also produces a line of commercial biplanes powered with air-cooled and water-cooled engines. These types have proven their value over a period of years on air mail and passenger lines.

ANOTHER ACTOR IN THE AIR



FLYING is great, Fred Stone thinks. He loves it because it gives him freedom. No schedule. Go any place. Fly anywhere he likes—Chicago, Cleveland, Atlanta, maybe to New York over the week-end. It's as pleasant as being one of the theatre's greatest actors.

So he ordered a new Travel Air (Type 4000) biplane with Whirlwind motor. Now he flies from city to city for his theatrical engagements always in the air—wants to fly and does fly. Finds it pays him well, too.

Professional men and business executives with vision agree with Fred Stone on air travel. They realize their time is too valuable to waste on slower kinds of transportation. That's why Travel Air has built a type of plane for every commercial need—each with proven performance and dependability. And that's why Travel Air is today building and delivering twenty planes a week.



Story of Travel Air on request, including the new Cabin Monoplane—"The Limousine of the Air."

THE TRAVEL AIR MFG. CO.

WICHITA, KANSAS

LeBLOND AIRCRAFT ENGINES

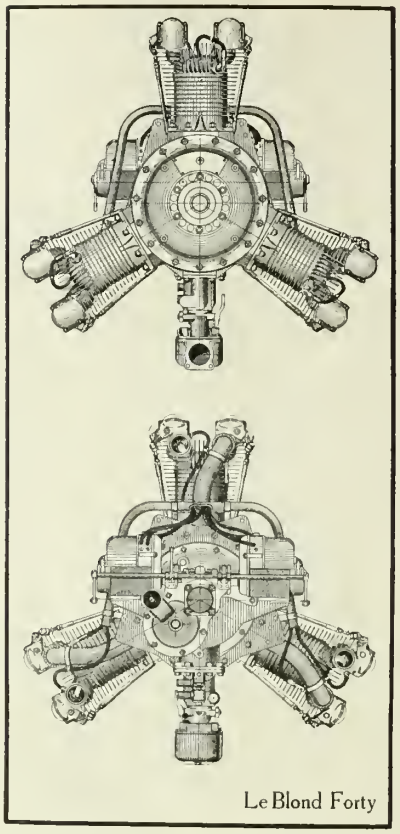
THE original development of the LeBlond Sixty design has been going on for over a period of three years, several engines having been built, block tested, and flown in several types of airplanes in all parts of the country by a number of experienced pilots. Their reports have been very favorable. This extended development period has allowed sufficient time to make minor improvements in the design and methods of manufacturing; in other words, eliminate any of the so called "bugs" which are always present to some extent in any new engine no matter how well designed.

Many advantages in interchangeability of parts are represented in the LeBlond Forty, Sixty and Ninety models. Fully 88 per cent of the parts used in one model can be used in one of the others. Moreover, there is hardly an instance where the tools and fixtures, or a part of them, will not be used for producing a corresponding part, which must necessarily be somewhat different because of the number of cylinders.

This interchangeable feature, coupled with the simple character of the design, makes it possible to produce a quality engine at a low price. Whenever the design of the airplane will permit, one engine may be quickly replaced by the next larger or smaller model such as might be the case, for example, in obtaining convenient interchangeability between a land and sea plane of the same design. The mounting and over all installation dimensions, including the hook up to carburetor, oil pump, etc., are substantially the same for all three models.

With an extreme over all diameter of 32¾ inches on all three models it becomes possible to arrange the cowling with excellent streamline effect and a minimum of resistance as required for cooling. The clean appearance, by virtue of having all the accessories and valve gear located at the rear, is also of some importance in this regard.

The smaller engine of the series, the three-cylinder Forty, is to fill the power plant requirements of the small single-seater



Le Blond Forty

sport or two-seater sport and training plane. This engine follows closely the five-cylinder design, hence the accompanying description for the most part applies. Perhaps the most interesting point of difference is the connecting rod construction, since the link rods and wrist pins are identical with those used on the Sixty and Ninety models.

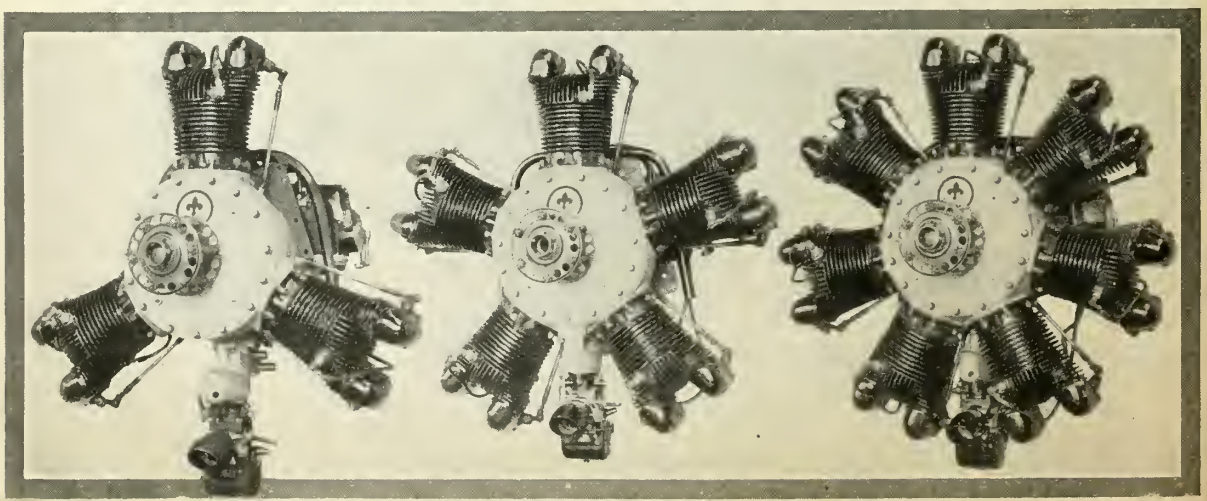
The five-cylinder Sixty is particularly suited for the privately owned two-seater open or closed airplane. It can handle a light three-seater plane, but is not generally recommended as plenty of reserve power is desirable as a matter of safety.

The connecting rods are completely assembled on the crankshaft and the whole assembly is inserted into the crankcase through the large opening at the front. The connecting rods are heat treated drop forgings of nickel steel. The babbitt in the master rod is applied directly to the steel. Although the rods are fairly light, the construction is extremely rigid and simple.

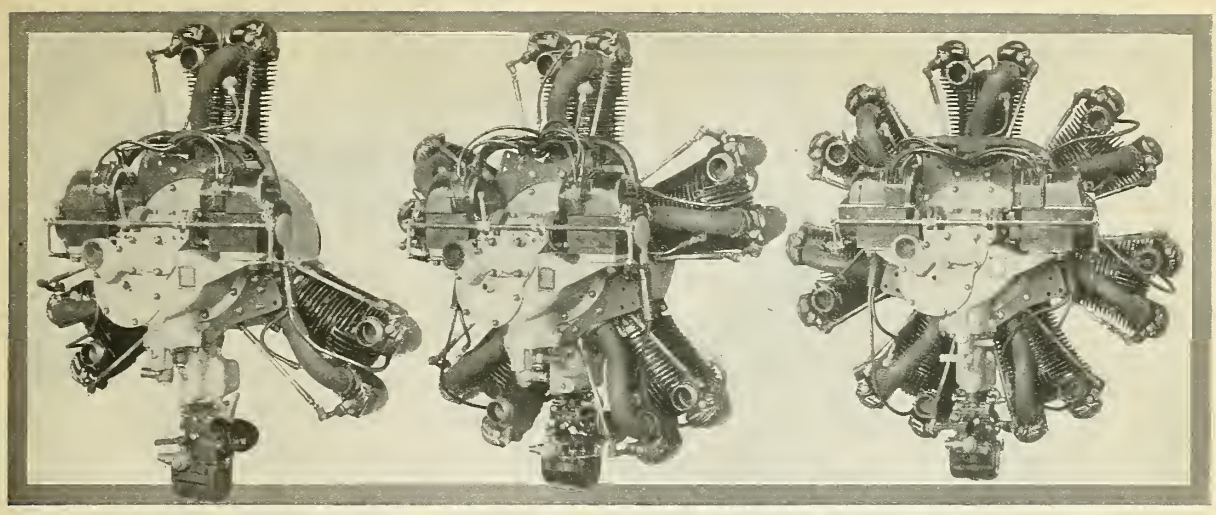
The crankshaft is assembled before the connecting rods are attached. This piece is a heat-treated drop-forging of nickel-chromium steel and finished allover. The counterweights are made from a tough grade of bronze, being supported against lugs on the crankshaft and each held in place by two screws. The rear ball bearing is finally supported in a steel sleeve held in the central wall of the crankcase, while the front ball bearing which also carries the propeller thrust loads, is supported in the crankcase cover that closes this large opening at the front of the crankcase.

The crankcase is a cast aluminum alloy, heat-treated to give high tensile strength. The inlet passage is cored in this casting, thus effecting a small number of manifold joints. The cam follower bushings, which are pressed in place, are cast of hard iron and the holes ground to close limits. The cam followers and rollers are assembled into the crankcase before the gear case assembly is attached to the flange at the rear.

In the gear case assembly the cam drive shaft pilots into the end of the crankshaft and is driven by offset lugs which will not permit of incorrect assembly; the cam and magneto timing need not be reset each time the gear case assembly is removed. The cam floats on the cam drive and lines up with the cam follower rollers when the gear case assembly is in place. A single ring cam is used to operate all valves. In the three-cylinder engine a two lobe cam turns at one-sixth crankshaft speed; while in the seven-cylinder



Propeller ends of the three types of LeBlond engines—forty, sixty and ninety horsepower



Rear ends of the LeBlond aircraft engines showing dual ignition, oil pumps, etc.

engine a four lobe cam turns at one-eighth crankshaft speed. The cam has a bronze bushing, and the cam drive shaft, idler shaft, and magneto drive shaft are also carried in bronze bushings and all are fed oil directly under pressure from the pump. The timing of the valves is effected through the adjustment provided in the gear and timing flange by the series of holes and the four screws.

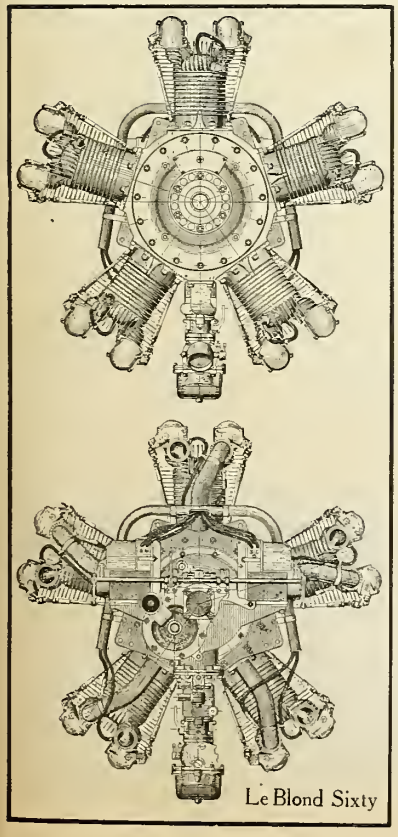
The oil pump is removable as an assembly. It contains two compartments, one for the pressure and the other for the scavenging gears, each with screens for trapping foreign particles in the oil. The driving gears are of steel and the driven gears of bronze. An oil pressure relief valve for controlling the oil pressure is also located conveniently in the pump body. Connections for oil lines to and from the tank can be adjusted to any desirable position.

The cylinder is a one piece casting of nickel iron with integral cooling fins. The valves seat directly in the cylinder head and the external portions of the valve gear is enclosed. All valve gear parts are interchangeable. The outside of the cylinder is finished with black stove enamel which adds to the appearance and to the heat dissipating qualities of the cylinder as well. The cylinder bores are honed.

The pistons are made from a cast aluminum alloy. There are two compression and one oil scraper ring located above the piston pin on each one. The piston pin is hardened and lapped and it floats in the rod and piston, there being duralumin plugs in each end to prevent scoring the walls of the cylinder.

Zenith carburetors of the concentric float type and provided with altitude mixture control are standard equipment on all models. The carburetor is attached to the lower side of the oil sump, the mixture passing through an opening in the sump where the heat from the oil surrounding the walls helps to vaporize any heavy portions of the fuel. Air heaters will be available as extra equipment.

Two Scintilla magnetos for dual ignition are standard equipment on each model, mounted in accessible positions.



Le Blond Sixty

SPECIFICATIONS OF LE BLOND AIRCRAFT ENGINES

Models Forty, Sixty and Ninety

Type.....Air-cooled radial
Bore .....4.125 inches
Stroke .....3.750 inches
Fuel consumption (lb. per h.p. hr.)
Max. .55 at rated power
Oil consumption (lb. per h.p. hr.)
Max. .03 at rated power

Le Blond Forty

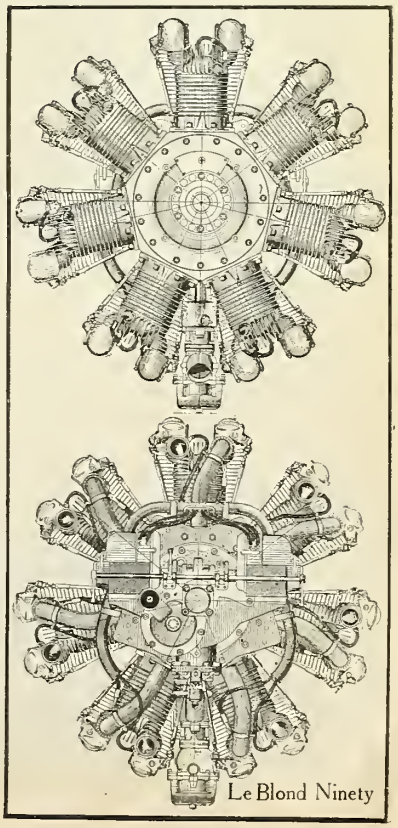
Number of cylinders.....Three
Displacement .....150 cubic inches
Rated horsepower.....40 at 1900 r.p.m.
Weight, complete..... 168 pounds
Diameter overall.....32.75 inches
Length overall.....21.94 inches

Le Blond Sixty

Number of cylinders.....Five
Displacement.....250 cubic inches
Rated horsepower.....60 at 1800 r.p.m.
Weight, complete.....210 pounds
Diameter overall .....32.75 inches
Length overall .....21.56 inches

Le Blond Ninety

Number of cylinders.....Seven
Displacement .....350 cubic inches
Rated horsepower.....90 at 1850 r.p.m.
Weight, complete.....250 pounds
Diameter overall.....32.75 inches
Length overall.....22.25 inches



Le Blond Ninety

CURTISS ROBIN

THREE-SEATER CABIN MONOPLANE

THE new Curtiss Robin is a three-seater closed cabin monoplane, powered with the Curtiss OX-5 engine of 90 h.p. As it will sell at less than $4,000 it is the first closed cabin plane in the popular-price field.

The cabin has been specially designed to equal, in comfort and convenience, a fine passenger automobile. Comfort is assured by generous seat space, ample leg room, and deep, soft cushions. The upholstery in the cabin is a rich, durable material, door handles, window lifts, and control sticks are fully nickeled, and the instruments are conveniently grouped on an instrument panel. Every precaution has been taken to make the cabin wind and weather tight, and as nearly soundproof as possible, so that passengers may enjoy their flights under any weather conditions without requiring special clothing, helmets, or goggles. Specially designed doors and windows, with narrow pillars, provide exceptional vision in all directions for both pilot and passengers. The two passenger's seats in the rear of the cabin are slightly staggered to provide plenty of shoulder room, but if desired, the seats, which are adjustable, can be arranged exactly side by side, forming one continuous, wide seat. This is particularly desirable when the Robin is used for instruction. For this purpose, a quickly attachable dual control stick and rudder-bar are provided. Just back of the passengers is a baggage compartment, fastened with hookless fasteners, and having ample capacity for three medium sized suitcases and small parcels.

The fuselage skeleton of the Robin is of welded chrome-molybdenum steel tubing, using a Warren truss. The motor mount is integral with the fuselage skeleton and is also of welded steel tubing. Engine section cowling is of aluminum, and fitted with quick-detachable cowl fasteners. The fuselage covering is fabric.

The landing gear is of the split type, each side being independent of the other. The landing gear arrangement is such that the wing lift truss also forms part of the landing gear truss, thus providing an exceptionally wide tread of 8 feet. Ring type Rusco shock absorbers are mounted in a compact unit on the landing gear strut. All struts are of steel tubing, with balsa fairing on the trailing edge. 26 inch by 4 inch wheels are used. The steerable tail skid, assuring easy taxying, is equipped with rubber shock absorber discs.



Casey Jones flying the Curtiss Robin with two passengers

The wing cellule is of the semi-cantilever monoplane type. The lift truss consists of two struts of airfoil section, extending from the bottom of the fuselage to a small auxiliary truss under the wing. The arrangement of this truss is such that there is no possibility of aileron loads causing warping of the wings, and thereby interfering with lateral control. The wing structure consists of Alclad metal ribs mounted on routed spruce spars. The metal ribs are pressed from a single sheet and combine excellent strength and weight characteristics with non-corrodibility. Built-up wooden drag struts are used. The leading edge of the panel, in accordance with usual Curtiss practise, is sheathed with thin sheet duralumin, and the wings are fabric-covered. The wing curve is the Curtiss-72, developed in the Curtiss aerodynamic laboratory. Rectangular, unbalanced ailerons are employed.

All tail surfaces on the Robin, with the exception of the horizontal stabilizers, are built up of welded steel tubing, fabric covered. The stabilizer construction is similar to that of the wings, with spruce beams and pressed Alclad ribs. Neither elevators nor rudder are balanced.

The pilot's controls consist of the usual type of stick and stirrup type pedals. For instruction, another stick and rudder bar can be quickly installed in the cabin for use by the student. Ailerons are controlled by push-rods, and cables are used for elevators and rudder. The stabilizer is easily adjusted in the air by means of a lever, conveniently located at the pilot's left side.

The OX-5 engine is mounted on a steel tubular motor mount, and is fitted with an exceptionally clean and compact nose radiator. Fuel is carried in two 25-gallon aluminum tanks in the wings, and is fed to the engine by gravity. Fuel may be fed to the carburetor from either tank. A wooden propeller is supplied as standard equipment, but a forged type Curtiss-Reed metal propeller can be supplied as extra equipment.

The strength and safety of every part of the Curtiss Robin has been carefully determined, through the Curtiss system of engineering. In addition to the stress analysis, which was worked out with as much thoroughness as for a military plane, and which showed strength factors equal to or exceeding Department of Commerce requirements in every case, an exhaustive series of structural tests were carried out on various parts of the plane. Fuselage and wing fittings, wing spars, ribs, tail surfaces, landing gear struts, tail skid, and many other parts were subjected to actual physical tests in the Curtiss laboratory, and found to be from three to ten times as strong as actually required.

The exceptional performance of the Robin is also attributed to the Curtiss engineering system, which combines scientific knowledge and equipment with years of practical experience in the design of the finest types of aircraft. Exhaustive tests were conducted in the Curtiss wind tunnel to insure the high degree of maneuverability and controllability desired, and speed, ceiling, and climb were pre-determined in the tunnel from other tests. Minimum weight with maximum strength has been achieved through a careful



The new Curtiss Robin passenger monoplane will be put in extensive production for commercial uses

Announcing . . . . .

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AN organization of specialists experienced in the various angles of air transport and aircraft operations. *More than a firm of consulting engineers,* — its activities include also traffic development, organization of flying operations, accounting and advertising.

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Looking forward in the cabin of the Curtiss Robin monoplane

and detailed system of weight control, combined with highly refined structural analysis and research on materials. The result is that the Robin possesses speed, climb and maneuverability characteristics that are superior to open cockpit planes in the same power class, along with its advantages of comfort and convenience provided by the closed cabin design.

Complete specifications of the Robin are listed below. The performance figures are the results of actual flight tests, conducted under the same conditions as prevail in the testing of governmental aircraft.

General Characteristics—Curtiss Robin

Wing loading.....8.28 pounds per sq. ft.
Power loading.....22.10 pounds per h.p.
Safety factor at high incidence.....6.5

Dimensions

Wing span.....41 feet 0 inches
Length overall.....25 feet 8½ inches
Height overall.....7 feet 9½ inches
Wing chord.....72 inches
Strut chord.....15 inches
Distance C.G. to rudder hinge....196 inches
Distance C.G. to elevator hinge..193 inches

Areas (in square feet)

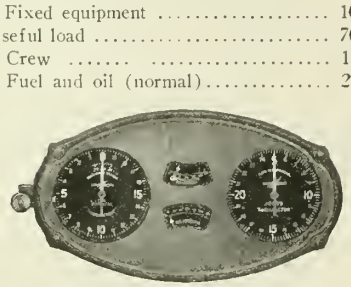
Wing, including ailerons.....265.2
Struts.....41.2
Ailerons.....22.3
Horizontal tail.....37
Vertical tail.....15.3
Elevators.....15
Rudders.....9.7

Power Plant

Engine.....Curtiss OX-5
Horsepower at 1580 r.p.m.....99
Fuel consumption at full throttle, 49 pounds per hour
Oil consumption at full throttle, 3.6 pounds per hour
Fuel consumption at 1200 r.p.m., 31.5 pounds per hour
Fuel capacity, normal.....30 U. S. gallons
Fuel capacity, maximum....50 U. S. gallons
Oil capacity.....4 U. S. gallons
Propeller diameter.....8 feet 6 inches
Propeller pitch.....5 feet 9 inches

Weights (in pounds)

Weight empty	1489
Structure	807
Power plant	575
Fixed equipment	107
Useful load	701
Crew	170
Fuel and oil (normal)	210
Equipment	21
Pay load (2 passengers)	300
Gross weight	2190



Curtiss Robin instrument panel

Performances

High speed at sea level.100.5 miles per hour
High speed at 5,000 feet.97.7 miles per hour
High speed at 10,000 ft...92.5 miles per hour
Landing speed.....45 miles per hour
Cruising speed.....83 miles per hour
Initial rate of climb.....450 feet per minute
Rate of climb at 5,000 feet, 315 feet per minute
Rate of climb at 10,000 feet, 180 feet per minute
Time of climb to 5,000 feet....13.8 minutes
Time of climb to 10,000 feet....33.8 minutes
Endurance, full throttle*..... 6.02 hours
Endurance at 1250 r.p.m.*.....9.35 hours
Range at full throttle*.....582 miles
Range at 1250 r.p.m.*.....770 miles
Service ceiling.....12,500 feet
Absolute ceiling.....16,000 feet
Climb in ten minutes.....3,800 feet

(*These performances while carrying 50 gallons of gasoline.)



Looking aft in the Curtiss Robin

DRAG OF WINGS WITH END PLATES

By PAUL E. HEMKE

Synopsis of N. A. C. A. Report No. 267

IN this report a formula for calculating the induced drag of multiplanes with end plates is derived. The frictional drag of the end plates is also calculated approximately. It is shown that the reduction of the induced drag, when end plates are used, is sufficiently large to increase the efficiency of the wing.

Curves showing the reduction of drag for monoplanes and biplanes are constructed; the influence of gap-chord ratio, aspect ratio, and height of end plate are determined for typical cases. The method of obtaining the reduction of drag for a multiplane is described.

Comparisons are made of calculated and experimental results obtained in wind tunnel tests with airfoils of various aspect ratios and end plates of various sizes. The agreement between calculated and experimental results is good.

Report No. 267 may be obtained upon request from the National Advisory Committee for Aeronautics, Washington, D. C.

DYKES AIRCRAFT ENGINE INSTRUCTOR

THE author of "Dyke's Automobile and Gasoline Engine Encyclopaedia" which has been the authority for the past 18 years, has recently brought out his first edition of the "Aircraft Engine Instructor." It gives unusually complete information on aircraft engines in regular production in the United States. The maintenance, overhaul and repair of engines have been dealt with very thoroughly.

Chapters are devoted to engine accessories such as magnetos, carburetors, starters, instruments, etc. Useful information contained in this book includes a summary of air laws, applications for plane, pilot and mechanic licenses, licensing of aircraft, pilots and mechanics, air traffic rules and requirements for the operation of aircraft. Other features of this work are the nomenclature of aeronautics as approved by the National Advisory Committee for Aeronautics, including nomenclature of airplane parts, alphabetical nomenclature and aeronautical symbols. Four large charts in three colors are published showing the lubrication of Wright Whirlwind engines, the Pratt and Whitney Wasp, Curtiss D-12, Packard and Fairchild Caminez engines.

Since Mr. Dyke has had the cooperation of the aircraft manufacturers, the book is regarded as most accurate and reliable.

The Aircraft Engine Instructor has nearly 400 pages, 7 by 10 inches, and 300 illustrations. The edges of the book are stained and it has a water proof flexible binding designed to withstand the hard wear of shop reference.



DEFEAT DETERIORATION
with
AMERILAC DOPE and LACQUER

LEADING aircraft manufacturers have come to the conclusion that there is but one way — by using AMERILAC.

The ability of these superior products to withstand the attacks that weather extremes exert on an airplane finish is due to patient and untiring efforts of our research laboratories.

Realizing the future greatness of aviation, the Aircraft Division of The American Varnish Co. also realized that "if it could long endure," a better finish for airplanes must be developed.

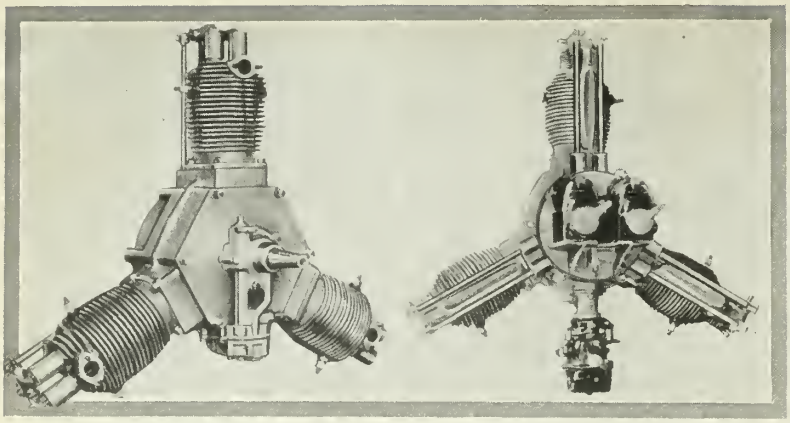
AMERILAC is that better finish. It has successfully withstood the most gruelling tests under all conditions. That is why it is so whole-heartedly endorsed by Stearman, and many other builders of superlative aircraft.

Even the smallest detail has been given careful consideration. The expansion and contraction coefficients of dope and finishing coat have been made uniform, thus reducing to a minimum any possible chance of cracking, checking or peeling; — and *strength,* well, it is in a class of its own.

Safety, durability and beauty are added to your plane when it is finished *from dope to final coat* with AMERILAC.

Send for booklet of color combinations.

AIRCRAFT DIVISION
THE AMERICAN VARNISH CO.
1138-46 NO. BRANCH ST. CHICAGO, ILL.



SZEKELY SKY-ROAMER

THE O. E. Szekely Corporation of Holland, Michigan, has produced a three cylinder, radial, air cooled engine for light aircraft, to be followed in the near future by a five cylinder, using practically all of the parts of the three cylinder.

The only visible moving parts are the push rods and rocker arms, all remaining parts being entirely enclosed.

The engine has a 4⅛ in. bore by 4¾ in. stroke, giving a total piston displacement of 190 cubic inches. Operating at its rated speed of 1800 revolutions per minute 40 horsepower is guaranteed; as a matter of fact, actual brake tests prove this engine develops over 42 horsepower. The compression ratio is 4.8 to 1.

The mounting flange for the engine consists of a round machined pilot fitted into the engine bracket on the plane. The engine is held in place by six tie rods, each of which pass entirely through the engine, so the front cover, crank case, rear cover and mounting bracket are securely locked together.

The cylinders are chrome nickel gray iron, with cylinder head cast integral and are held to the crank case by four studs. Each cylinder has a skirt or piston guide extending approximately 2½ inches into the crank case.

Intake and exhaust passages are scraped and sand blasted and the entire cylinder is provided with numerous thin fins to provide ample radiation for the air cooling.

Valve seats are part of the cylinder and are 45 degree angle. Two valves are used in each cylinder, these being silchrome steel, mushroom type, 45 degrees seat, providing a clear gas flow area of 2½ square inches. The valves are 1-13/16 inches in diameter by 11/32 inch lift. The valves are actuated from the cam through hollow push rods with hardened ends and bronze bushed drop forged rockers.

Tappet adjusting screw is placed in the rocker and locked in position, after adjustment, by a screw.

In the lubricating system a double type gear pump is driven by a bronze spiral gear directly from the crank shaft. Four spur gears are used in the pump itself, the upper set receiving oil through a ⅜ inch line from an oil tank in the plane and delivering it, under pressure, to the connecting rod bearings and, by splash, to the main bearings, gears and cylinder walls. Two other gears form the scavenging pump and are slightly larger than the delivery pump. This picks up the oil from the lower part of the case, to which surplus runs, and delivers it through a ⅜ inch line to the oil tank.

The oil relief valve and the take-off for oil gauge is placed at the rear of the engine so oil pressure reading is taken after the oil has passed entirely through the engine. The pressure at the pump is approximately six times the reading given at the rear of the engine. This is said to be an additional safeguard, as it shows the pilot that each part of his engine is receiving sufficient lubrication as long as oil pressure shows on the gauge. A gauge pressure of 4 to 10 pounds is recommended, which means the pump pressure usually noted on other engines is 40 to 60 pounds.

The crank case is aluminum alloy, with front and rear covers of the same material. These covers hold the main bearings. The main crank shaft bearings are of the roller bearing type and located as close to the center of the crank pin as it is possible to get them, thus reducing chances for crank shaft whip and consequent vibration to the minimum.

The intake manifold is cast as an integral part of the crank case, in the form of a circular chamber with opening flange for carburetor at the bottom of the engine. Three outlets from this circular chamber are connected to the cylinder by an individual aluminum intake manifold, which fastens to each cylinder and is packed in such manner with gasket at the crank case that expansion and contraction may occur without putting a strain on any part of the engine and still without permitting air leaks.

The crank shaft itself is No. 3140 S. A. E. material, having a diameter of 1-37/64 inches. The connecting rod bearing on the crank shaft is 1-7/16 inches by 2 inches. The crank shaft is a single piece drop forging, to which counterweights are added to insure perfect balance of the engine itself.

The propeller thrust bearing is of the deep groove, radial ball bearing type and is taken directly between the front of the crankshaft and the front gear cover of the engine itself.

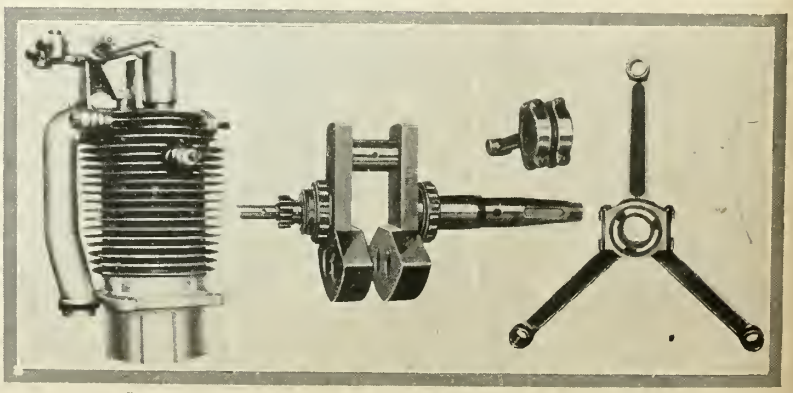
Connecting rod assemblies are drop forgings heat treated for toughness and machined all-over. Upper end of the connecting rod is bronze bushed. The lower bearings are sections of a cylinder cut on an angle with the axis of the bearing and contact with a bronze bearing, the internal portion of which is babbitt lined and free to revolve around the crank pin.

Oil pressure is delivered to the main connecting rod bearing and to each individual connecting rod bearing. This connecting rod assembly is said to provide greater insurance of complete lubrication and larger bearing surfaces in proportion to the load placed upon them than conventional practice of a master rod with round pin rods operating from it.

The pistons are of aluminum alloy, solid skirt type, each equipped with three ⅛" piston rings. The piston pin is hollow, hardened and ground and fastened to the aluminum piston at either end, but of the full floating type, in that it is free to turn both in the piston and in the connecting rod bearing.

The cam arrangement is indeed interesting and, while novel, has been used in other services for a number of years by the Szekely organization, so that nothing untried is being used in this respect.

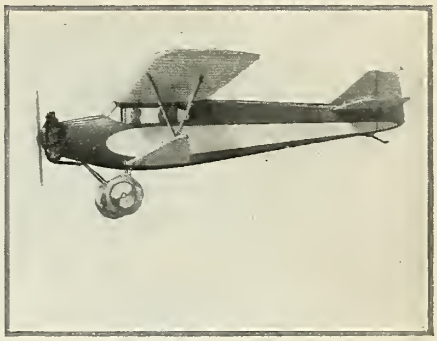
There is but one cam to operate both the intake and exhaust valves on each cylinder. This cam is driven from a spur gear on the crank shaft and operates the valve through the means of a hardened and ground



Szekely cylinder, crankshaft and connecting rod assemblies

NOW THERE ARE THREE TYPES OF BUHL AIRSEDANS

To cover a very wide range of commercial and private uses. Each type is built to the high standards of strength and efficiency which characterize Buhl productions.



The BUHL Junior Airsedan

The Buhl Junior Airsedan is a smaller scale replica of the Standard Airsedan. It carries a useful load of a thousand pounds and maintains a cruising speed of 95 miles per hour.

Specifications:

Weight empty.....1,200 lbs.
Wing span.....36 ft.
Wing area.....240 sq. ft.
Length .....25 ft.
Useful load.....1,000 lbs.
Seating capacity—pilot and 2 passengers

Performance:

High speed (sea level).....110 M.P.H.
Landing speed.....45 M.P.H.
Cruising speed.....95 M.P.H.

Power Plant:

Warner
Horse power.....110 at 1,800 R.P.M.
Fuel capacity.....50 gal.—8 hours
Oil capacity.....3 gal.

The Buhl Special Airsedan is designed for use where load is subordinated to speed. It carries a useful load of 1000 pounds and has a high speed of 132 miles per hour.

Specifications:

Weight empty.....1,500 lbs.
Wing span.....36 ft.
Wing area.....240 sq. ft.
Length .....28 ft.
Useful load.....1,000 lbs.
Seating capacity—pilot and 2 passengers

Performance:

High speed (sea level)....132 M.P.H.
Landing speed.....45 M.P.H.
Cruising speed.....115 M.P.H.

Power Plant:

Whirlwind
Horse power.....200 at 1,800 R.P.M.
Fuel capacity.....80 gal.
Oil capacity.....5 gal.

The Buhl Airsedan is the standard plane of the Buhl line. It accommodates four passengers comfortably in a sound-proof, easy-conversation cabin.

Specifications:

Weight empty.....2,100 lbs.
Wing span.....42 ft.
Wing area.....334 sq. ft.
Length .....28 ft.
Useful load.....1,628 lbs.
Seating capacity—pilot and 4 passengers.

Performance:

High speed (sea level) 120 M.P.H.
Landing speed.....45 M.P.H.
Cruising speed.....100 M.P.H.

Power Plant:

Wright Whirlwind.....J.5
Horse power 200 at 1,800 R.P.M.
Fuel capacity.....70 gal.
Oil capacity.....5 gal.

Department of Commerce Certificate of Airworthiness No. 12

Distributors:

***In the Northwest*—Mamer Flying Service, Spokane, Wash.**
***In the Southwest*—Frank Baker Aircraft, Culver City, Calif.**

BUHL AIRCRAFT CO.

Marysville, Mich.

cam follower, this is bronze bushed and located by means of a hardened and ground pin fastened to the crank case.

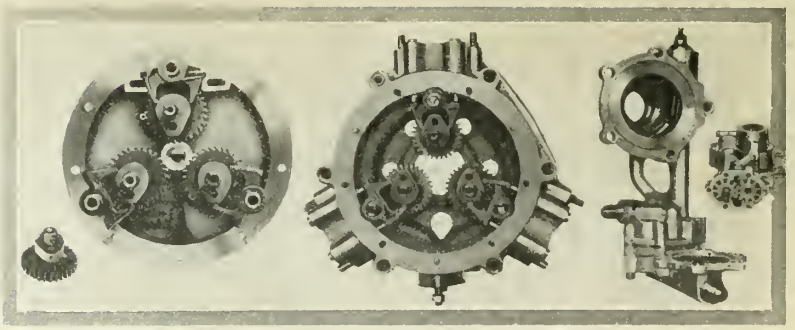
The ignition system consists of two Robert Bosch magnetos mounted on a shelf which is an integral part of the rear cover and driven from the engine by means of spur gears. Each magneto fires a spark plug on each of the three cylinders, so the engine is provided with two independent ignition sources.

The carburetor is suspended below the engine and connected to the crank case by a Venturi type manifold. It is the Zenith, 1½ inch, balanced airplane type.

The propeller hub is heat treated steel. Each propeller hub is lapped to the crank shaft of its own engine, in addition to the precision operation of grinding both the hub and the crank shaft.

The weight of the engine, with all accessories, is guaranteed by the manufacturer not to exceed 153 pounds. The average production engine weighs approximately 148 pounds.

Tests have demonstrated that this engine is well suited for a single or two place plane having from 25 to 30 feet wing span and weighing between 475 and 525 pounds. As installed in such a plane, the engine turns a 40 horsepower propeller at 1,725 revolutions per minute on the ground and better than 1,850 in the air, in this way giving an ideal cruising speed of from 80 to 85 miles per hour, at an engine speed of from 1,550 to 1,600 revolutions per minute.



Details of crankcase, cam valve gear and oil pump, Szekely 40 h.p. engine

Flight tests show that the fuel consumption under average conditions, is approximately .58 pounds per horsepower hour, with an oil consumption guaranteed not to exceed .029 pounds per horsepower hour.

Installation drawings and a brief description of this engine were published in the February issue of AERO DIGEST.

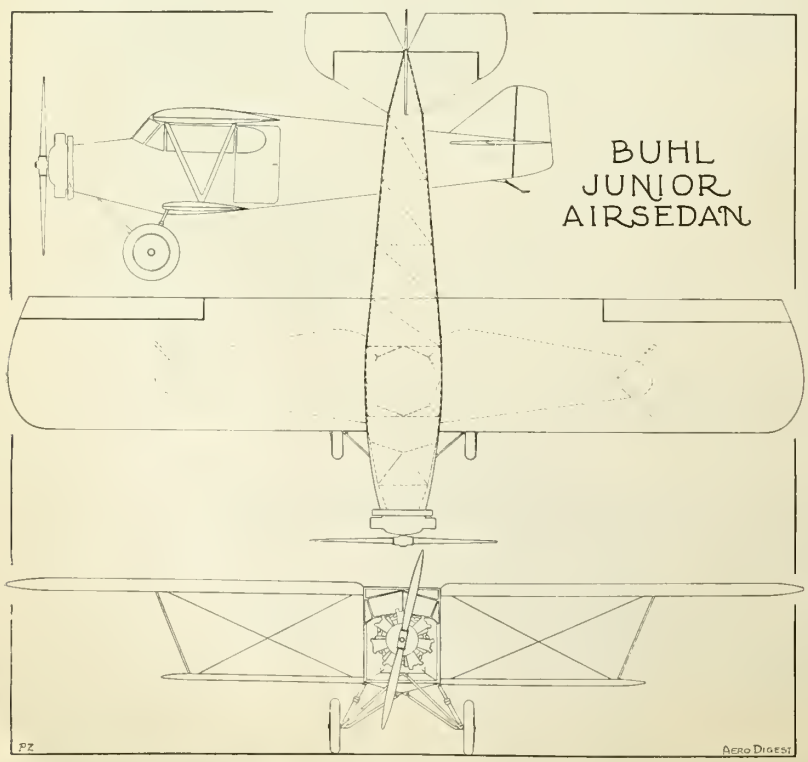
BUHL JUNIOR AIRSEDAN

POWERED with the 110 h.p. Warner air-cooled engine, the new Buhl 3-passenger Junior Airsedan is designed to carry a useful load of one thousand pounds. The first of these planes, now nearing completion at the Buhl Aircraft Co., Marysville, Michigan, will probably make its first public appearance in the Ford Air Tour. It is expected that the Junior Airsedan and the "Special" Airsedan (similar in all respects to the Junior, but powered with a 200 h.p. Wright Whirlwind) will compete in the Air Tour, although not especially designed for the purpose.

Following the general aerodynamical design of the well known standard Airsedan these two new light commercial types promise to become as popular as the larger 4-passenger Airsedan which made its appearance about a year ago.

The Junior has a number of structural novelties that make for ease of operation, lightness in weight and aerodynamical improvement. Perhaps the most radical feature is the inverted control stick. The stick is swung from the roof of the cabin, leaving the region of the pilot's legs free from all obstructions. This system eliminates a number of control parts and permits a direct application of the stick forces to the ailerons and elevators. The stick is of streamline tubing which creates no undue disturbance to the pilot's vision.

Near the tips of the ailerons a small balanced area of the Frieze type extends for a short distance, making these surfaces exceptionally light and effective in operation.



Three-view outline assembly drawings of the new Buhl Junior Airsedan

With the Warner engine turning up at 1800 r.p.m., and developing 110 h.p. the high speed attained is 110 miles an hour. Other specifications are as follows:

Junior Airsedan

Wing empty	1,200 pounds
Wing span	36 feet
Wing area	240 square feet
Length	25 feet
Useful load	1,000 pounds
Fuel capacity	50 gallons—8 hours
Oil capacity	3 gallons
High speed (sea level)	110 miles per hour
Landing speed	45 miles per hour
Cruising speed	95 miles per hour

The "Special" Airsedan, powered with the Whirlwind engine, has the same useful load, 1,000 pounds, and the same seating arrangement for pilot and two passengers; it is also similar to the "Junior" in regard to wing span, wing area and landing speed. Other data and performances are as follows:

Special Airsedan

Weight empty	1,500 pounds
Length	28 feet
Fuel capacity	80 gallons
Oil capacity	5 gallons
High speed (sea level)	132 miles per hour
Cruising speed	115 miles per hour



The 6-Place International Air Coach

—the "Pullman" of the air . . . surpassing in every detail ships costing thousands more!

No wonder interest at the Detroit Air Show centered about this popular International model.

For no other ship within thousands of its price compared even remotely with the Air-Coach. Its roomy, luxuriously appointed passenger cabin actually seats five full-grown passengers in Pullman comfort, with every conceivable convenience including full vision windows, ventilators, smoking equipment, cabin heater, duplicate instrument board, etc.

The high quality construction and streamline design of the Air-Coach, its marvelous performance in speed, stability, and safety are typically International. Still this big cabin ship, because of efficient quantity production methods, costs but $11,000 in the air, completely equipped with 200 H.P. Wright Whirlwind motor. Correspondingly lower priced of course, with less expensive motors. We would like to send you free our new illustrated treatise on this and other International models. May we?

The F-17 "Sportsman", another International model, is an ideal 3-place open plane, identical in design and construction to the Air-Coach, but slightly smaller. $2,750 without motor.

Manufactured under Air Commerce Department Approval Certificate A-35.

THE INTERNATIONAL AIRCRAFT CORPORATION

(formerly of Long Beach, California)

CINCINNATI, OHIO

INTERNATIONAL *Aircraft*

BUILT TO A STANDARD — NOT TO A PRICE

BELLANCA MODEL P

THE Bellanca model P transport is a twelve-place cabin monoplane powered with a 500 h.p. Pratt & Whitney Hornet engine. It was flight tested last month giving pilots and officials an opportunity to watch its performance. The ship flies easily and with its full pay load (exclusive of gas, oil and pilot) of 3,025 pounds and with its normal load of twelve passengers or approximately 2,400 pounds, it took off in eight seconds from the time it was given the gun. No top speed tests have been run as yet but the ship cruised easily at 115 miles per hour.

Captain Ceasar Sabelli, Italian flier, plans to fly this ship from New York to Rome. It is estimated that the plane will be able to get into the air with its transatlantic load of four passengers and a fuel load of nearly 1,100 gallons in 2,500 feet.

A unique feature is the lower wing and landing gear. The gear retracts into the lower stub wing leaving a complete airfoil section with no air obstructions. The retractable feature will be used only in special cases. Since here there is no initial strut obstruction, the resistance from the fixed wheels is very slight so that the gain in retracting the wheels is not great. However, in case of the amphibian design where the floats are attached at the low angle of the stub wing, the retractable feature will be used. On the ground, the wide track of the wheels permits easy handling.

This particular plane has been fitted with extra tanks for an endurance and a transoceanic flight and for this reason the side windows have not been put in. The cabin has a capacity of 335 cubic feet. As soon as it has been thoroughly tested, production will start on the regular twelve-passenger transport planes based on this design.

Dimensions

Span, upper wing	65 feet
Span, lower wing	16 feet 6 inches
Length	38 feet 9 inches
Height	11 feet 6 inches

Areas (in square feet)

Wings, including ailerons	606
Wings	552
Ailerons	54
Stabilizer	51
Elevators	32
Fin	12.5
Rudder (balanced area, 3 square feet)	23.5

Weights (in pounds)

Airplane, empty	3000
Useful load	4350
Gasoline, 180 gallons	1080
Oil, 10 gallons	75
Pilot	170
Pay load	3025
Gross weight	7350
Useful load in per cent of gross weight	59 per cent
Wing loading, pounds per square foot	13.3
Power loading, pounds per h.p.	14.7

Performances

Maximum speed	130 miles per hour
Cruising speed	115 miles per hour
Landing speed	46 miles per hour
Range at maximum speed	600 miles
Range at cruising speed	700 miles
Service ceiling	14,500 feet

AC PLUGS ON WILKINS ARCTIC FLIGHT

AC SPARK PLUGS were used with excellent results throughout the arctic flying experiment from Alaska to Spitzbergen, a cablegram from Captain George H. Wilkins and Lieut. Carl B. Eielson, to the AC Spark Plug Company, states. The historic non-stop flight of 2,200 miles was the first transpolar journey by airplane.

"KING COTTON" IN THE AIR

By William P. Gaffney

COTTON as a covering for airplane wings has proven itself over many years of service, and at the present time requires no defense of its use on modern aircraft.

It was evident even before the entry of the United States in the great war that the total available supply of linen would not be sufficient to meet the demand. In 1916 definite steps were taken to develop another source of supply for linen, in the way of attempting to encourage a domestic flax growing industry of sufficient proportion to supply the aircraft needs. This was not entirely successful and early in 1917 the Signal Corps of the Army directed the Bureau of Standards to develop a cotton fabric as a substitute for linen. Most of the credit for the success of this project is due to the organization of the Bureau of Standards, although a number of others were of material assistance in the technical and manufacturing phases of the problem.

Very few changes have been made in the original fabric to arrive at the present standard mercerized cotton airplane fabric.

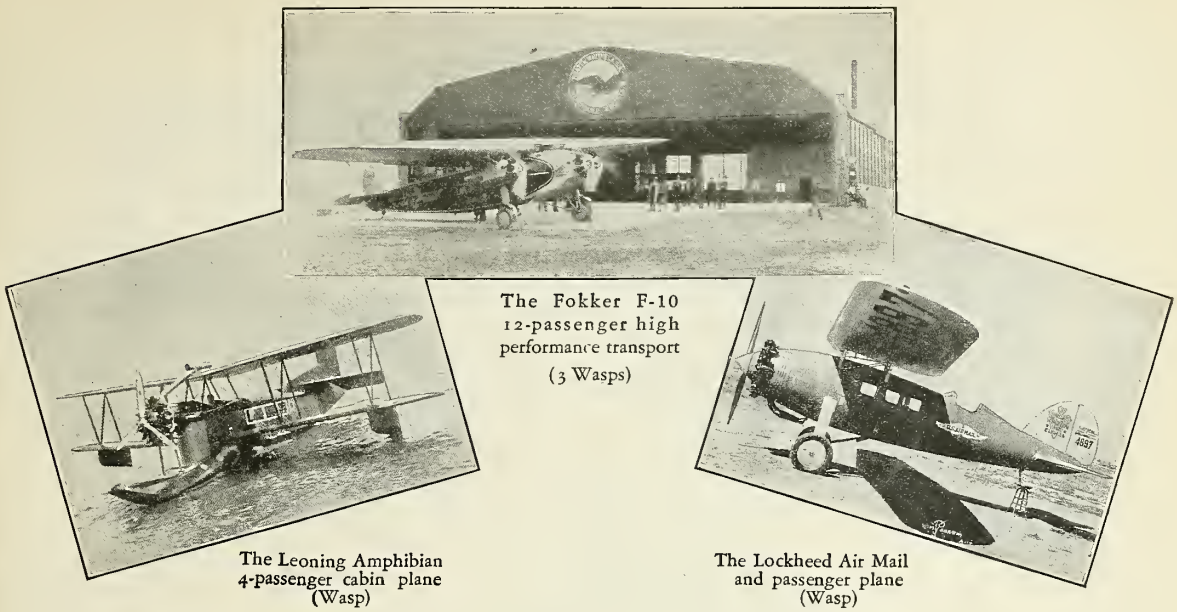
The reason linen is used on European aircraft is because it is readily obtainable in that part of the world. At the present time there are a few well equipped mills in this country who have had long experience in the manufacture of aircraft fabrics and have kept in constant touch with the requirements of aircraft industry. These mills, while few in number, can supply sufficient quantities to meet any requirements or emergency that may present itself to the industry.

New developments in airplane fabrics have been made through the efforts of individuals in this field. Certain items in processing and finishing, such as desizing, tentering and calendering, have proved profitable to the aircraft manufacturers. Developments along the lines of singeing and bleaching airplane fabric is also receiving consideration at the present time. It is realized the necessity of producing for the aircraft manufacturer even a better and a more worthy fabric for airplane construction, so that he may meet the exacting requirements of increased aerial development.

Briefly, cotton airplane fabric has the following main characteristics: it is composed of long staple cotton, has two-ply mercerized yarns in both the warp and filling, it is a woven fabric, has a strength of not less than 80 pounds per inch in each direction, has definite stretch characteristics under equally definite loads, weights approximately 4.0 to 4.2 ounces per square yard (not more), but good cotton airplane fabric does more than conform to a number of test values. The real worth of an airplane can only be measured by a service test. A well designed cotton fabric will last considerably longer than an operator would permit it to remain without inspecting the structure which it covers.



The Pratt & Whitney-engined Bellanca Model P Transport on one of its test flights



The Fokker F-10 12-passenger high performance transport (3 Wasps)

The Leoning Amphibian 4-passenger cabin plane (Wasp)

The Lockheed Air Mail and passenger plane (Wasp)

Versatility of the Commercial Wasp

The 400 H. P. "Wasp" is demonstrating a most remarkable versatility of application in commercial use. The "Wasp" is now installed in more than twenty various types of commercial ships, including land planes, sea planes, and amphibians, varying from the smaller individually owned four and five passenger cabin planes to giant tri-motor passenger and mail ships. In the service of one transport company alone commercial "Wasp" engines have been flown almost one and one-half million miles, carrying mail and passengers.

PRATT & WHITNEY, U.S.A. DEPENDABLE ENGINES

THE
PRATT & WHITNEY AIRCRAFT CO.
HARTFORD CONNECTICUT

"WHIPPOORWILL" CABIN PLANE

THE Whippoorwill is a cabin type biplane of conventional design, seating three passengers and pilot in the ordinary sedan fashion; the pilot is not separated from the rest of the cabin. Particular attention has been given to retaining good visibility, ease of entrance and a comfortable seating arrangement. Ample leg room has been provided in both front and rear compartments, eliminating the necessity of sitting in a cramped position.

The fuselage construction is of the Warren truss type, chrome molybdenum tubing being used throughout. The Wright Whirlwind engine is employed as a power unit. The engine mounting, instrument panel, etc., are detachable and removable by the release of four 7/16 inch taper pins.

Control surfaces, except ailerons, are of tubular steel construction. Control wires being on a straight pull, eliminate all pulleys. Positive wheel control is used on the ailerons, the gearing being such that little effort is required to operate them, making it possible to fly with one hand as is customary with the stick control.

Wings are of conventional design, having solid spars, routed out for lightening, with the web type rib and plywood entering edge, on both top and bottom sides of the wing panels. Round tie rods are used for the internal bracing.

The following equipment is carried as standard: Standard Steel or Hamilton metal propeller; Sauzedde wheels and brakes; complete set of Pioneer instruments (excepting earth inductor compass); complete set of landing and navigation lights; electric inertia starter; automatic windshield wipers. (Heating arrangement is provided whereby the frosting of windshield is eliminated.

The coach work in this airplane compares favorably with high quality automobiles. All windows are operated with a crank system, the interior of the cabin is finished with the best grades of mohair, colors and designs being optional, and all exposed woodwork is of walnut. The cabin is lined with Balsam Wool.

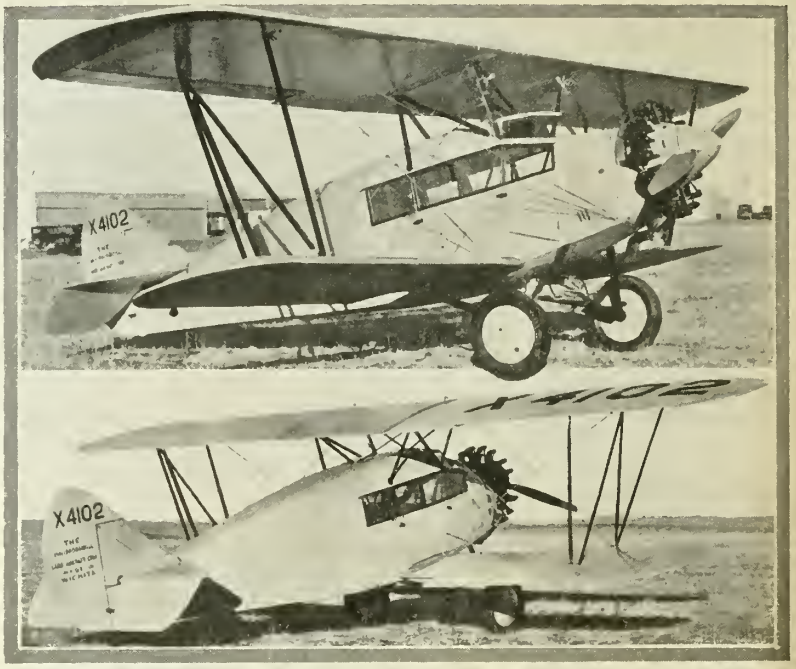
A separate door at the front of the cabin permits the pilot access without disturbing the other occupants of the plane.

A collector ring and exhaust muffler reduces the engine noise and an air heater is provided for the carburetor.

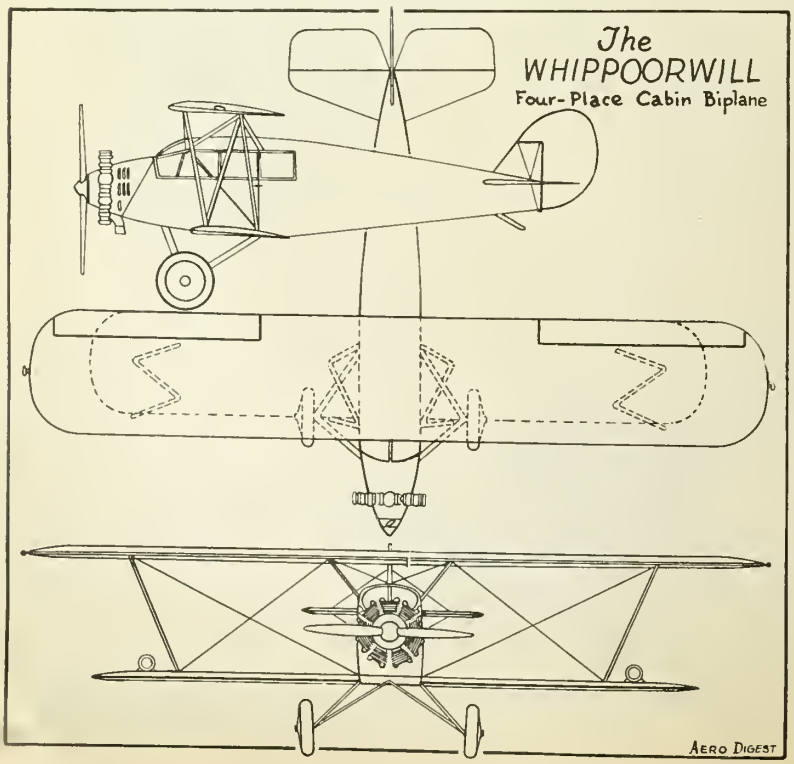
The Whippoorwill is the product of the Laird Aircraft Corporation of Wichita, Kansas, and it was designed by Charles L. Laird of that city. The officers of the organization are as follows: H. D. Cottman, president; W. H. Gaskins, vice president; Leva D. Murray, secretary and treasurer; Charles L. Laird, director and chief engineer; and the following directors—A. H. Hill, A. E. Hurford and Bruce D. Billingsley.

The following is a list of general specifications of the Whippoorwill.

Wing span, upper	36 feet
Wing span, lower	30 feet
Wing chord, upper	6 feet
Wing chord, lower	58 inches
Incidence angle, both wings	2½ degrees
Wing area (including ailerons)	351 sq. ft.
Length over all	27 feet
Height over all	9 feet 6 inches
High speed	135 to 140 miles per hour
Cruising speed	105 miles per hour
Landing speed	45 miles per hour
Speed at take-off	65 miles per hour
Take-off run with full load	400 to 500 feet
Climb, first 5,000 feet	6 minutes
Time of climb to 10,000 feet	15 minutes
Weight, empty	1650 pounds
Useful load	1000 pounds



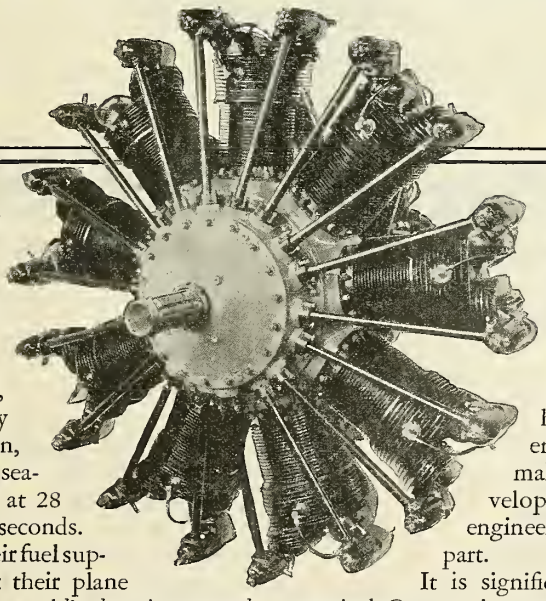
The Whippoorwill biplane manufactured by the Laird Company of Wichita, Kansas.



A NEW ENGINE— The Wright CYCLONE

Makes a New World's Seaplane Record

36 hours — 1 minute — 13 4/5 seconds



The Flight

WHEN, on Thursday, May 3rd, Lieutenants Gavin and Soucek, U.S.N., took off from the Delaware River at Philadelphia, in their PN-12 plane, carrying J. C. Proley, Navy mechanic, and W. F. Dayton, Wright mechanic, the world's seaplane duration record stood at 28 hours, 35 minutes, and 27 seconds.

When on May 5th, with their fuel supply exhausted, they brought their plane down, they had established a world's duration record of 36 hours, 1 minute, 13 4-5 seconds and the two Wright "Cyclone" engines had proved their fitness to carry on the Wright tradition of dependable efficiency.

The Engine

THE Wright "Cyclone" nine cylinders, 525 h. p. is a big brother to the 200 h. p. "Whirlwind" and the latest and largest member of an honored family of air-cooled engines—a family of record-makers in whose design and development the able advice of Navy engineers has played an important part.

It is significant that the Wright Aeronautical Corporation now offers for service in commercial aviation a new engine which already has a world's duration record to its credit.

That's why More Pilots fly them!

WRIGHT

WRIGHT AERONAUTICAL CORPORATION, *Paterson, N. J., U. S. A.*

CANADIAN WRIGHT LIMITED, Sole Licensees for Canada Montreal



A Record to be Proud of
NEVER A STRUCTURAL FAILURE

BRILLIANT PERFORMANCE
AMAZING MANEUVERABILITY
RUGGED, DEPENDABLE CONSTRUCTION

Together with its dazzling beauty of design and finish have firmly established the American Eagle as

"Master of the Skies"

Performance

Take off in 60 feet
Climb, 1500 ft., 2 min. 5 seconds
High speed, 100 M.P.H.
Landing speed, 30 M.P.H.
Ceiling, 16,000 feet
Useful load, 850 lbs.
Cruising duration, 5 hrs.

With OX5 Motor

Welded seamless steel tube fuselage, tail group and undercarriage, steel tube aileron controls, selected airplane spruce and laminated mahogany wing construction.

APPROVED TYPE CERTIFICATE NO. 17

Price, with OX5—$2885

Prices with other motors listed in catalogue

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WESTERN NEWS

ALEXANDER CO. ORDERS 1,000 FLOCO ENGINES

THE Alexander Aircraft Company, Colorado Springs, Colo., have contracted for 1,000 Floco motors which deal figured at the unit list price of the motor amounts to $2,750,000. As far as is known this is the largest single contract ever signed for commercial airplane motors. The manufacturer of the Floco motor is the Frank L. Odenbreit Company, Inc. of Los Angeles, and Long Beach, Calif. The deal was negotiated by W. M. Patch, 23-year old head of the Patch Realty Company of Redlands, Calif., distributing organization for the Floco motor.

This transaction was completed in Colorado Springs, after Thomas M. Hardesty, director of sales, T. C. Alexander, chief test pilot, and W. M. Patch, made a record flight from Los Angeles in the Floco demonstration ship and gave J. Don Alexander and his staff of engineers full opportunity to put the Floco engine through an exhaustive series of block and flight tests. The 2,600-mile round trip flight was made in 26 hours and 45 minutes, despite adverse weather conditions encountered over various areas, both going and coming.

First delivery of the engines will be made to the Eaglerock Company about June first. The first four Floco motors to be received will be installed in Eaglerocks for demonstration purposes. The demonstration ships will be shown to the forty Alexander distributors scattered throughout the country. Fifty additional motors will be delivered about the first of July and consignments will be received thereafter at the rate of fifty per month or more.

The Alexander Aircraft Company has an option on the entire wholesale output of the Odenbreit factories until the 1,000 motor contract has been filled. This will include the output of a new and larger major production factory.

The contract is dependent upon the approval of the Floco motor by the Aeronautics Branch of the Department of Commerce. The test motor is on its way to Washington and approval on same is expected soon. The engine was described and illustrated in the March issue of AERO DIGEST.

HIGH SCHOOL OPENS AERO DEPARTMENT

THE Galt Joint Union High School at Galt, Calif., has announced a complete aeronautical course for students. The course extends over the regular four year high school period beginning with the study of general science and aircraft theory through mechanical drawing, airplane design, engines, aerial navigation, meteorology and principles of flight, practical flying and U. S. Air Commerce regulations.

William Rutherford is the principal of the High School and reports that the new school has entire support of the community.

DOUGLAS COMPANY PRODUCTION PLANS

THE Douglas Company plans to place two commercial planes, one a biplane and the other a monoplane, in production this July or August. Experimental work on the two planes is rapidly nearing completion.

The company's engineering department is busy with development work on metal type planes and redesigning 25 Navy PD-1 type planes, formerly known as the PN type. This department is also engaged in the development of a new training observer plane, powered with a 200 h.p. Wright Whirlwind for the Army Air Corps.

Delivery of the first of 72 02H type planes for the Army Air Corps was made last month and production is well under way on 25 PD-1 type flying boats for the Navy. The PD-1 plane is said to be the largest plane in production in the United States or abroad at this time. It was the experimental plane of this type which recently shattered the world's endurance record for flying boats, remaining aloft for 36 hours and 1 minute, or 8 full hours better than the previous record. Shipment of first T2D-1 type, three purpose planes equipped with interchangeable land and water gear was also made to the Navy this month.

Ground for the new factory being erected by The Douglas Company was broken April 1st and production in the new quarters will be started July 1st. This plant, which will cover a total of 110,000 square feet of floor space, will enable the Douglas Company to double its present production by July 1929. Officials of the company plan to keep their present plant in operation for several months after production is started in the new factory.

The new building will provide for a 300 per cent increase in the company's engineering facilities. This department will occupy 4,000 square feet of floor space, while the number of men employed in the shops will be increased from 550 to 900.



T. C. Alexander, Thomas Hardesty and Frank L. Odenbreit

RANKIN SYSTEM OF FLYING INSTRUCTION

By J. G. "Tex" Rankin

President, Rankin School of Flying

THIS business of flying depends more upon the character of the young men and women who are entering the profession than any other industry. Granted that those who are knocking at the gates of the innumerable flying schools throughout the country are basically sound, the most important factor in the progress of aviation is the development of pilots who are properly trained for successful life work.

We have found in the development of our own system of flight instruction that the most important element in our entire curriculum is the emphasis which we place upon the fact that flying, if done right, is safer than any other form of transportation. We teach our students to remove every possible chance for failure before attempting anything. After many years in the business of producing pilots we have yet to record a single serious accident.

During recent months we have had many requests from operators of schools in other cities for permission to use our system of instruction. After careful consideration we decided to have our course printed in one hundred pocket-size booklets. An instructor's book is also off the press. This preliminary work over, we are offering exclusive franchises to schools in population centers all over the United States.

Our venture has made headway from the start and a number of good schools are already successfully operating under our franchise. We maintain a regular supervision over these schools so that they are in point of fact branch schools administratively independent of our own.

RUSSELL PARACHUTE DEMONSTRATION TOURS

TO introduce the Russell lobe parachute to the aircraft firms and air mail and passenger lines in Great Britain and Europe, H. R. McClintock, president of the Russell Parachute Company of San Diego, is now on an extensive tour through those countries. Mr. McClintock is accompanied by John Tranum, veteran Danish parachute jumper, who is making a series of exhibition flights at British, German, French and Scandinavian airdromes to demonstrate the efficiency of the lobe parachute.

The Russell Parachute Company also is sponsoring a 12,000-mile tour of the United States by Al Strader and James Young, on which these two men are to demonstrate the Russell parachute. The purpose of this national air tour is to bring home to the American public the necessity of increasing the safety factor of air travel by equipping each passenger and pilot with this essential aid to air navigation.

D O U G L A S

F I R S T A R O U N D T H E W O R L D



Constantly combating the elements · · · following their course over mountain peak and desert floor · · · winging their way through arctic blast and the ocean's stiffest gale · · · Douglas planes blazed a trail around the world, for the first time in all history, and emerged at their journey's end, triumphant.

The Douglas organization that made possible this outstanding feat of yesteryear, stands squarely behind the performance of each Douglas plane, today.

Into each plane, Douglas engineers skillfully weave the same time-and-again-tested principles of aeronautical design that grant this plane supreme air-worthiness. Taking nature's finest materials, master craftsmen mould them into the finished product. Thus is built into each plane that superior stamina that instantly identifies it as Douglas-built.

Then follows test upon test, not only of the plane itself, but finally determining the soundness of the Douglas principle, and again in the crucible of nature each Douglas plane earns its spurs—the right to wear, and uphold the honor of, the Douglas trade mark—the insignia that ever emphasizes the fact that Douglas Means Dependability.

THE DOUGLAS COMPANY

Santa Monica  *California*

CALIFORNIA AIR NEWS

THE Lindbergh Beacon, an 8,000,000-candlepower airport light, built by the General Electric Company and erected atop the City Hall tower in Los Angeles, was officially turned by President Coolidge, who touched a button in the White House at Washington.

The light is in the nature of a monument to Colonel Lindbergh, presented to him by the people of Los Angeles. The beacon is lighted by a 900-watt filament lamp, burning before a 24-inch mirror, the beams pouring through a 24-inch lens. The reflecting mirror is so designed as to throw a concentrated beam of light that can be seen a distance of 60 miles in fair weather. The beacon will revolve six times in a minute.

An interesting feature of the beacon is that there are two lamps to it. They both rest on the same base, which is pivoted, the working lamp being at the focal point. Should this lamp burn out during the night the base carrying the two lamps automatically will trip the new lamp into focus and light it.

A NUMBER of Liberty engines will be sold at the Naval Air Station, North Island, San Diego, Calif., to the highest bidder. Bids will be opened by 10:00 a.m. June 14.

The material can be inspected at the San Diego Naval Air Station daily, except Saturday afternoons, Sundays and holidays.

THE success attending the work of the Universal School of Aeronautics at Hollywood, Calif., has impelled its founders to enlarge. In consequence the school has been incorporated as the Universal Institute of Aeronautics. Additional capital has been obtained and facilities for taking on more students have been added. The offices of the school were at Hollywood and the lecture rooms were in Los Angeles. These are being consolidated with much larger space in Hollywood. Negotiations are now under way to secure the institute's own flying field in North Hollywood, which will be equipped with all facilities for flying instruction, cross-country navigation, night flying instruction, field lighting and installations and other courses.

The founders of the school remain in charge with Captain T. Cameron Wilkinson as president. Other officers of the Institute are: Frank Kenyon, vice president and treasurer; M. V. Curtis, vice president, and George B. Harrison, secretary. These with W. E. Tijou and E. Burrell Smith are the corporation's directors.

COMMANDER W. E. WYNN, a member of the Royal Air Force from 1916 and a member of the British Air Ministry in charge of desert operations from Cairo to Bagdad during the war's latter period, has been engaged by the Maddux Air Lines of California to lecture on behalf of commercial aviation.

He will lecture before leading clubs and fraternal organizations of California, covering the key cities of the Maddux Air Lines' present route—San Francisco, Oakland, Fresno, Bakersfield, Los Angeles, Long Beach, Santa Ana and San Diego. He will accompany his talks with a motion picture history of aviation, with the object of arousing as much interest as possible in the immediate uses of airlines.

RESIDENCE school classes in practical instruction on latest type airplanes and motors were opened by Pacific Technical University of San Diego on May 1st with a full enrollment. The course in ground work is being given to students of the Ryan Flying School with which the institution is affiliated and thoroughly covers all phases of practical aviation.

As a means of acquainting the public with the rapid growth and development of aeronautics, the University conducts free lectures on Wednesday night, given by aviation authorities in California, to which all air-minded people are cordially invited.

THE Ryan Flying School has issued a very attractive booklet describing the equipment and training courses offered to students.

Three carefully prepared courses of study are available. A Primary Course, giving twelve hours of flying and one month ground school instruction; Advanced Course—forty hours of flying, two months ground school instruction, which is limited to students with solo flying experience; and a Complete Course—fifty hours of flying, three months ground school instruction.

AVIATION will be featured at the Pacific Southwest Exposition to be held at Long Beach, Calif., July 27—August 13. Comprehensive displays outlining the progress of motor stage, rail and air transportation will be included.

The Palace of Aeronautics will contain an historical display of early airplanes and motors. Prizes are being offered for the longest non-stop airplane flight to the exposition and the longest flight regardless of stops. Special prizes are offered for notable flights from Latin-American countries.

SAN FRANCISCO BAY

By R. J. Leidy

AN aircraft show and aeronautical institute is to be staged at San Leandro the middle of September. Sponsored by the San Leandro Chamber of Commerce, the show has the support of the Chambers of Commerce of other bay cities. It has the approval of the Department of Commerce, as well as national aeronautical organizations.

THE Citizens Aviation Association of U. S. A. recently organized a division of the association in the East Bay District, which includes Oakland, Alameda, Berkeley, Richmond, San Leandro and Hayward, Cal.

Frank W. Epperson has been elected president of the association; Joseph B. Gardner, vice president; John C. Scott, 2nd vice president; Henry H. Young, secretary and John C. Williams, treasurer.

The association recently held their annual aero exhibit at 1418 Webster, Oakland at which there were many interesting exhibits. Some of the firms represented were Aircraft Industries, Inc., Boeing Air Transport Co., Pacific Air Transport Co., Wasp Airplane Co., Thaden All-Metal Aircraft Co., and Breese Aircraft Co. The Ernie Smith Aircraft Co. had a Pheasant airplane on display.

Major Livingston G. Irving officially opened the exhibit. Thomas Traynor was in charge of the exhibit.

MAJOR LIVINGSTON IRVING, Oakland pilot, and one of the Dole race entrants, has been promoted to the position of Air Officer, 91st Division Reserve Air Corps. He formerly was commanding officer of 316th Observation Squadron of the United States Reserve. Irving has his flying broadcasting plane, the "Redwing", hangared at the Oakland airport, and during his spare moments makes tourist flights over Mt. Diable and other beauty points of the bay region.

"THE daddy of the air mail" was a recent visitor in the bay district en route to Siam. He is Otto Praeger, second assistant postmaster general of the United States from 1915 to 1921. Praeger was in charge of establishing the first mail route between Washington and New York in 1918. He will supervise the entire air mail system in Siam.

INSTALLATION of a radio telephone set in the offices of the Pacific Air Transport company at the Oakland airport was recently completed by D. H. Cordano, radio expert. Sets have been installed at Portland, Medford, Bakersfield and Los Angeles. They operate on 46 meters in the day and between 87 and 100 meters at night.

ANOTHER airplane agency has been established at the Oakland airport by Franklin Rose and Sam Metzger, sub-dealers for the Stearman biplane. Two Stearman planes are being used for demonstration purposes.



The new Crawford Model A-1 parasol monoplane powered with a rotary LeRhone engine

MAHONEY



B. F. Mahoney and Col. Chas. A. Lindbergh standing by new Ryan Brougham recently delivered to Col. Lindbergh



on Land or Water

THIS BROUGHAM is destined to dominate the Whirlwind cabin monoplane field. ¶ As a *sea* plane, equipped with Edo Pontoons, take-off with five people and 67 gallons of gasoline has been made in 18 seconds. ¶ As a *land* plane, with **five** people and 83 gallons of gasoline, it has taken off in 8 seconds. ¶ Performance—where performance is most needed, maneuverability, stamina, unusual appointments, exceptional workmanship, and the application of sound, basic engineering maintain the Mahoney Brougham in a class by itself—at a price that will interest you!

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CAPITOL AIRWAYS, INC.	Washington, D. C.
MAYER AIRCRAFT CORP'N	Bridgeville, Pa.
BUFFALO AIRCRAFT DISTRIBUTORS	Buffalo, N. Y.
KNAPP FLYING SERVICE	Ypsilanti, Mich.
MIDWEST AIRWAYS, INC.	Milwaukee, Wisc.
NORTHROP AEROPLANE CO.	Minneapolis, Minn.
MIDWEST AIRWAYS CORP'N	Monmouth, Ill.
STRANSKY AIRLINES INC.	Pukwana, S. D.
SOUTHWEST RYAN AIRLINES	Tulsa, Okla.
MISSION AIRPLANE SERVICES	San Antonio, Texas
THOMPSON FLYING SERVICE	Salt Lake City, Utah
MUTUAL AIRCRAFT CORP'N	Los Angeles, Calif.
RANKIN FLYING SERVICE	Portland, Ore.
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THE MAHONEY AIRCRAFT CORP'N

Owners of Ryan Air Lines and Ryan Flying Company

San Diego *St. Louis*

CONTACTS

By Frank E. Samuels

THE regular meeting of the Professional Pilots Association May 8th was attended by over 40 members and a number of invited guests, among them being Allen Lockheed, head of the Lockheed Aircraft Company, Dr. T. C. Young, chairman of the field committee of the National Air Races, and Daddy Montee, our oldest licensed pilot. Clarence Prest, president of the Association presided.

Mr. Lockheed read a personal letter from Captain Wilkins, written from the land of snow and ice, just before he took off for Spitzbergen. Dr. Young described the airport that he has under contract for the National Races and Cliff Henderson, chairman of the committee for the International Aviation Exposition to be held in connection with the National Races, told of the progress being made by the committee. Short talks by a number of members and others brought to a close an evening of good fellowship, both instructive and entertaining.

THE United Air Service, California distributors of Lincoln Page aircraft, has opened a beautiful show room in the heart of Hollywood, where there is on exhibition one of the latest sport model Lincoln Page three-place ships. The show room itself is a credit to any business, decorated after the style of a high class automobile show room.

A TRIP through the Hallett Manufacturing Company plant with Mr. Hallett describing every phase of the building of their air-cooled motors, from the time their first model was designed up to the present product on the test block, was enjoyed by yours truly during the past week.

Mr. Hallett has taken over a four-acre plot of land at Inglewood and will eventually move his entire plant to this new location. At present the machine shops and offices are at the old site. The foundry has been built on the new site. The only parts not made at the plant are the ignition system and carburetors. Mr. Hallett intends to have 500 completely finished motors on hand before he starts to release them. Within 30 days he will be on a production basis of one a day, within 60 days two a day and by the first of the year he expects to be turning out six a day. Mr. Hallett is sole owner of the company.

JACK O'BRIEN, the night-flying advertising pilot, before he started east in the Menasco-motored Stearman, stated that he had flown the No. 5022 Menasco engine over Los Angeles at a low altitude at night for advertising purposes for 150 hours and during that time he did not have a single forced landing or a particle of trouble. Mr. Menasco informs us that this motor, including the 50 hours that Jack O'Brien flew it, had flown 515 hours. Some record!

ANOTHER firm that is branching out featuring engines, parts and supplies, is Spillane & Company of Los Angeles. Realizing the great strides that the aviation industry is making, they have moved from Hope Street, where they combined the sales of automobile and airplane parts, into a large room on South Main Street, and have fitted it up exclusively as a salesroom for airplane motors and supplies.



The parasol type full cantilever wing Lockheed "Vega" monoplane

CARL S. CLARK, secretary of Western College of Aeronautics, reports the total enrollment of students of the college as being 121 up to date. A revised list of instructors include: Wm. J. Waterhouse, C.E., A.E., dean; Carlton E. Stryker, A.E., engineering instructor; Alfred Livingston, B.S., A.M., mathematics, physics and mechanics instructor; George E. Irwin, transport pilot, and chief instructor of ground course; Harry H. Boore, machinist, instructor machine shop; L. R. McGehee, Lt., A.C.R., chief pilot; Carl S. Clark, business organization; John C. Simpson, airport development, navigation, meteorology, air traffic rules; E. J. Morgan, assistant machine shop instructor; John M. Mobley, assistant engine instructor; Floyd Adams, rigging instructor, construction of ships and instruments; and A. E. Miller, welding instructor.

THE Los Angeles Airways, Inc., flying field is a busy place these days. Looking over their student enrollment book, we counted 47 students who had contracted for their entire flying and ground courses. Ole Olson, chief pilot for the company is kept busy seven days a week.

OUR friend Mike McInaney of the Alexander Aircraft, is paying Los Angeles a short visit. While here he made a change in the agency for the Eaglerock planes for Northern California. Under the new arrangement the Aero Corporation of California take over the agency previously held by J. L. Mayberry. This new arrangement gives Aero Corp. the entire state.

SHORTS FLYING SCHOOL, situated on the direct route to the Los Angeles harbor, is in an ideal location for summer business—close enough to the ocean so that the cool west winds, prevalent at all times, give the field a nice head wind for take-offs and landings. Pilots are invited to land at the field and pay Stanley a call.

THEODORE T. HULL has just returned from a flying trip to Mexico City, where he conferred with the aviation officials and pilots for the coming Pan-American race from Mexico City to Los Angeles, to be held in connection with the National Air Races. Mr. Hull, who is president of the American Aircraft Company, made the trip in one of the company's Fairchild cabin jobs.

WHILE at the American Aircraft flying field, I read on the bulletin board of the resignation of J. B. Alexander as general manager of the company. We surely will be sorry to lose him at the field. Dave Postal is now general manager.

ANYONE who is doubtful as to the benefit derived from consecutive, conservative advertising in the aviation magazines, should get in touch with the Scully Brothers, aviation helmets and glove manufacturers. On January of this year they commenced advertising and in checking up their business on May 1st they found that since that time they have done more business than they did in two years before. From January 1st to May 1st, their business increased 1400 per cent over the same period of 1927 and 133 per cent over the total business done in 1927. They are receiving orders, not only from every state in this country, but from every part of the world.

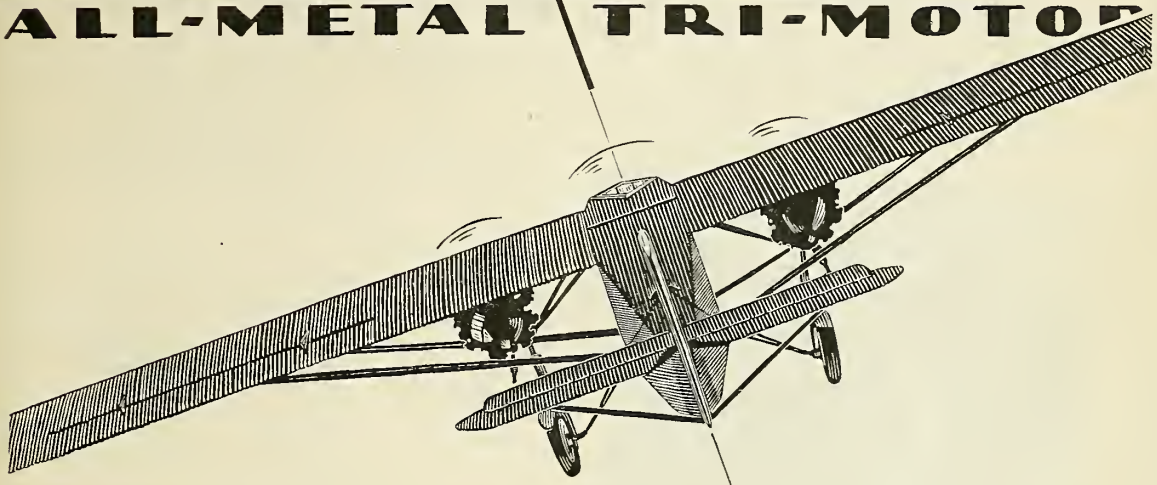
RALPH MONTEE has just returned from a three months' mapping job down in Texas and is mighty glad to get back to Los Angeles. Good flying conditions and home cooking appeal to Ralph.

THEODORE A. WOOLSEY, president of Thunderbird Aircraft, Inc., now has his organization turning out three planes a week trying to catch up on orders. They are over 28 airplanes behind in deliveries. John Heddon, former Lincoln distributor of Long Beach, was recently appointed business manager of the Thunderbird plant and Lieut. Eldo Peterman was added to the staff of engineers, and is chief inspector. Lieut. Peterman is a Kelly Field graduate and University of California engineering graduate.

LESLIE MILLER, head of the Miller Airplane Products, reports that for the first time in five months the plant is nearly caught up with outstanding orders and that they are now in a position to make quick delivery on new orders. More machinery going into the plant every week has rushed along production. The plant is a busy spot.

PRUDDEN

ALL-METAL TRI-MOTOR



ECONOMY IN AIR TRANSPORTATION

Comparisons show the Prudden *Tri-Motor* All-Metal plane operates as economically per passenger mile flown as any *single* engined air transport. All-metal construction practically eliminates depreciation, upkeep and repairs. And there is also the insurance provided by three engine power. Write for *Comparative Cost Estimate* on your proposed line. We have an attractive Distributor proposition. *8-Place... Dual Control... $25,000 Flyaway*

PRUDDEN-SAN DIEGO AIRPLANE COMPANY
SAN DIEGO, CALIF.

AM 7

ALEXANDER COMPANY AT COLORADO SPRINGS

FIRE razed the wing doping and covering building of the aircraft manufacturing division of Alexander Industries, Inc., Denver, April 20th taking the lives of eleven persons.

Unfortunately, erroneous press wire reports were too hurriedly broadcast over the United States. The report was that the entire film and aircraft plants had been destroyed. From competitive concerns throughout the country came offers of their facilities for the continuance of the five million dollar annual Alexander business. A most splendid display of American sportsmanship. The Eaglerock output was hampered by the destruction but temporary facilities were immediately contemplated.

Monday night, April 23rd, the company was informed by county officials that the entire plant must be closed preliminary to an extensive investigation. Such a procedure would have been ruinous as thousands of film advertising contracts had to be filled on schedule or the customers of that great business inconvenienced. Over 300 members faced unemployment.

At Colorado Springs, 75 miles south of Denver, was being erected the huge new factory buildings which were to be the new home of the Industries some time within the year. None of the new buildings were sufficiently completed to allow installation of equipment and men. The company was in what is commonly known as a "jam".

Following a midnight meeting of the board of directors, the decision was reached to leave Denver at once. By daylight nearly the entire 300 employees had been gathered and the work of moving the great plant was under way. Denver moving companies released all available vans and the grounds of the Alexander Industries at dawn had taken on the semblance of a troop movement in war time.

Twenty-four hours after the move had started, all of the employees who had been working in Denver were again continuing their tasks in Colorado Springs. Temporary housing had been arranged.

HONOLULU AIR NEWS

By Vern Hinkley

PLANS for the formation of the first company devoted to commercial air service in the territory of Hawaii are nearing culmination. A group of business men, some of them army aviators during the world war, have laid the groundwork for a line between Honolulu and Hilo, 200 miles by air, and are now soliciting the necessary capital. It is understood that they are endeavoring to make a connection with an already established Pacific coast air line.

The Honolulu base will be at the John Rodgers airport which is rapidly nearing completion. At Hilo the planes will use the Waiakea airport, a landing field built on an old lava bed of dredged material from the harbor. This project, paid for by territorial funds, has been in the course of development for more than three years.

The schedule will call for stops on the island of Maui and at the Upolu airport, Hawi, on the north point of the island of Hawaii where the army already has developed a base.

CHARLES STOFFER, well known Pacific coast pilot who returned to Hawaii in March after an absence of three years, has obtained a plane and will open a school for pilots in the near future. It is understood that he is also negotiating for the agency of a well known cabin monoplane.

Arthur Goebel, winner of the Dole race and a close friend of Stoffer's, is said to be interested in the project. Goebel is to return this month from Japan where he has been on a goodwill tour.

ARRIVAL of the battle fleet has resulted in a largely increased air activity for Honolulu. Formations of scouts from the 10 battleships here are to be seen aloft daily in maneuvers. A number of former Pearl Harbor air officers are here with the ships. Included in the group are Lieut. C. F. Harper, now on the *Texas;* Lieut. W. J. Walker, now on the *West Virginia;* Lieut. Emil Chourre, now on the *Langley* and Lieut. William Sinton, also on the *Langley.*

Contrary to expectations there was no concentration of army planes the morning of the arrival of the warships. Twenty-five army ships were aloft in one group as a welcome gesture but no air problems or tactics were involved.

Galt Joint Union High School and Junior College
Galt, California

ANNOUNCES

A complete four year aeronautical course beginning the Junior year of High School work and ending at the completion of the Sophomore year of College, especially preparing high type young men for the Army and Naval Cadet Schools and higher engineering schools. All work, including fifty hours of dual flying instruction, is given gratis. This work and also post-graduate work is limited to a selected group of students whose character and past training, including a rigid physical examination, is passed, and who are finally selected by the admission committee.

The Galt Joint Union High School has aroused national and world-wide interest during the last two years as the first High School known to actually introduce flying and aeronautical work in a public four year High School. During the past year, gifts from the Government and other sources in aeronautical equipment have exceeded the sum of $150,000.00, including the latest and most modern flying planes. Owing to the demand and the large amount of equipment on hand, the Board of Education has established a Junior College course in addition to the High School work, the college work being accredited by the University of California.

The Galt Joint Union High School and Junior College is located in the famous Sacramento Valley only fourteen miles air distance from the famous Government Mather Field. The school has its own flying field adjoining its buildings and is one of the model fields of the valley, having graded runways in all directions and capable of handling any amount of traffic.

ADMISSION

Students are expected to make formal application for admission to the High School and Junior College upon blanks supplied for the purpose. Information is sought by this means not only concerning the scholarship of the student but also concerning his character, attitude, and probable ability to appreciate and co-operate with the ideals and standards of the College Department and a limited number of those who meet these questions will be acceptable.

Students from other approved high schools or colleges are admitted without examination upon presentation of properly authenticated certificates showing in detail the requisite completed courses.

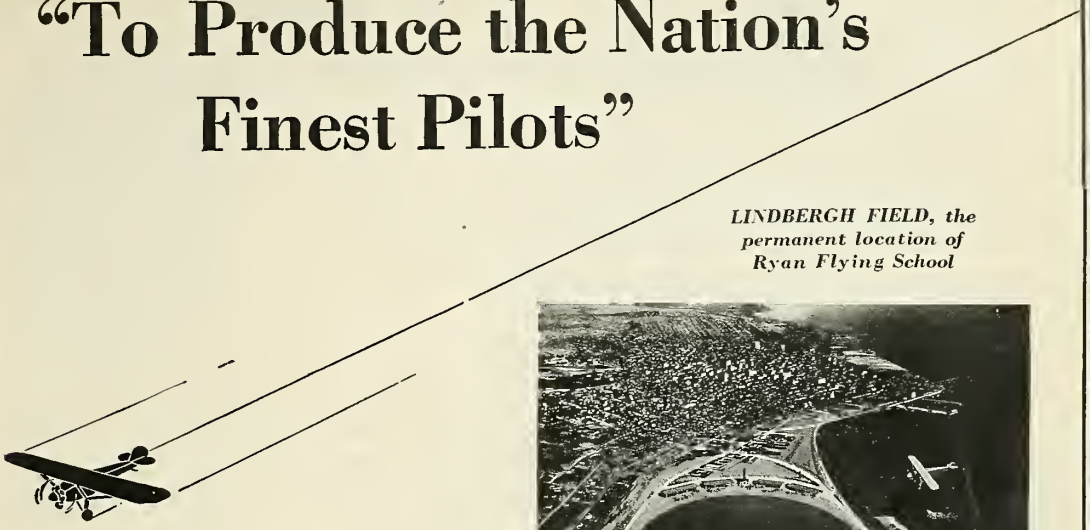
Blanks will be furnished by the Secretary of the High School and Junior College, on which the record of the work done will be certified.

ADMISSION UNITS

For admission to the Junior College Department, high school graduation with a total of fifteen (15) recommended units is required. The definition of the word "unit" as accepted by the University of California in its admission of students into that particular institution.

For further information address the Aeronautical Department, Galt Joint Union High School and Junior College, Galt, California.

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UTAH AND IDAHO NEWS

By Glen Perrins

SALT LAKE CITY recently purchased 93 acres of land, east of the flying field, thereby increasing the city-owned area more than 50 per cent for future landing field development.

Improvements are being added. Installation of boundary lights will be completed in the near future.

Rules are proposed for safeguards. One proposed rule provides that all aircraft pilots and mechanics operating at Woodward field must hold Department of Commerce licenses. Other rules are designed to prevent danger to onlookers as well as to pilots and planes during landing and taking off of planes.

THE Thompson Flying Service, Inc., of Salt Lake City, has been organized to take over the business of Tommy Thompson at the airport and to engage in a passenger, freight and mail business.

THE latest arrival at Salt Lake City airport is a new Travel Air plane purchased by John W. "Jack" Sharpnack, air mail pilot. He flew the plane from the factory and intends to make his home here.

FINANCING of the Twin Falls, Idaho, airport will be done by organization of a stock company, it is reported. Monthly rental charges of from $25 to $60 for commercial airplanes may be made in addition to rental of hangars, etc. The new airport site consists of 360 acres adjoining the Snake river and will have runways 2,600 feet long.

AN appropriation of $20,000 for improving and lighting the Boise, Idaho municipal airport was voted by the city council, the money to be raised by a one mill tax levy.

EDISON E. MOULTON, Department of Commerce inspector, recently arrived in Salt Lake. He urged strict administration at the field, and gave it high praise for its efficiency.

WITH Lieut. Russell L. Maughan, famous dawn-to-dusk flier, "Tommy" Thompson, air circus manager, taking part, the Idaho Falls municipal airport will be dedicated July 4. Lieutenant Maughan is now commandant of the Salt Lake area air base.

AN emergency landing field for airplanes will be established at once in the Tintic valley, with the renting of 200 acres of farm ground to the Department of Commerce. Present plans call for smoothing the ground, installation of boundary lights, a tower and wind gauge and erection of small building for storing gasoline and oils.

COLORADO AIR NEWS

DEWEY TIDWELL and G. A. Cole, officials of the Colorado Flying Club and members of the Colorado Chamber of Commerce, are planning to move the Colorado airport and all equipment to a larger tract of land yet to be selected. The new port will comprise an 80 or 90 acre field, equipped with flood lights, 7-place steel structure hangar, gas and oil facilities, and radio receiving and sending set for weather forecasting.

The Colorado Flying Club will continue to give flying instruction and commercial flying of all kinds. Officers of the club are: president and secretary, Dewey D. Tidwell; vice president and treasurer, J. C. Fish; chief pilot and field manager, Grady A. Cole.

WYOMING AIR NEWS

WYOMING AIRWAYS, of Casper, has recently received a permit from the Public Service Commission for the operation of an intra-state aerial traffic system. The company will operate under federal regulations supplemented by the Wyoming air laws passed at the last session of the state legislature.

Plans call for the initial route to be established between Parco and Jackson. In the former town improvements of the landing field are already under way in anticipation of aerial tourist traffic for the summer. A landing field will be built at Jackson, and the Pinedale Commercial club is planning to construct a field at Pinedale for an intermediate stop.

Other projected lines are from Casper to Sheridan, Cody, Cheyenne and Dubois, the latter route via Riverton or Lander. Casper will remain as the company's headquarters for commercial service and training school.

Officers of the company are Walter Storrie, president; Dick Leferink, vice president; D. P. Wardwell, secretary, J. E. Davis, treasurer; R. H. Nichols, director.



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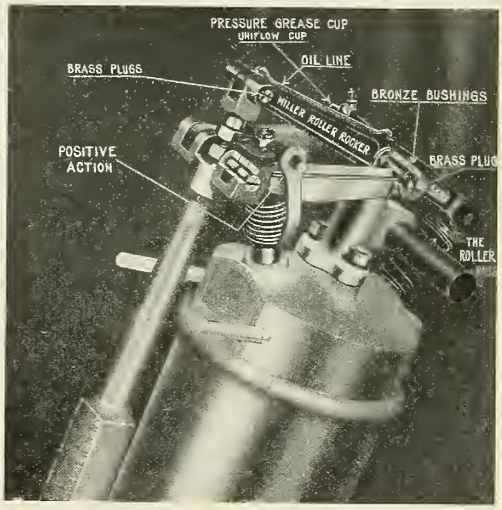
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ARIZONA AIR NEWS

By Al Wein

HOWARD RINEHART and Verne Whelan, both of Dayton, Ohio, have sold their interest in the East Van Buren Airport at Phoenix to Sam Witten, a Phoenix boy who received instruction at the field. Witten has employed Bill Kingsley, formerly of San Diego, as pilot.

Charlie Roberts, former chief mechanic at the airport, has opened up a garage near the field. Nels Peterson, another mechanic, went to Dayton with Rinehart and Whelan.

COOLIDGE, a town that was opened up recently and which is on a direct air line between Phoenix and Tucson, is already making plans to secure an airport. A delegation from Tucson visited the hamlet and pointed out desirable tracts to be used for landing fields.

THE South Central Airport at Phoenix, operated by the Aero Corporation of Arizona, has signed "Shorty" Miller, well known Pacific Coast parachute jumper, to thrill the crowds every Sunday.

PROMOTERS of the proposed St. Louis to Los Angeles western air route visited Winslow recently and announced that that city would be on the route. The proposed airline will follow U. S. Highway 66.

ADDITIONAL work is being done on the runways at the Willcox Airport which was dedicated recently. Approximately 1,500 persons were present at the dedication.

THE Flagstaff Aero Club has ordered an Alexander Eaglerock plane equipped with a Hisso motor. The Flagstaff club, although organized but a short time ago, has 40 charter members.

THE Aero Corporation of Arizona, operating the South Central Airport at Phoenix, will make its summer headquarters at the Ernest A. Love Airport at Prescott. Charles Goldtrap, chief pilot of the corporation, has already lined up several students at Prescott and will remain there from June 15 to September 15. His equipment will include two Eaglerocks.

AN airplane will be used to ship asbestos from the mines in northern Gila County to the Southern Pacific station at Rice, according to H. P. Wrightman who has purchased several asbestos properties. The distance by air will be 30 miles, while by truck it would be 150.

WORK has been started on the new airport at Florence, an old cow town of Arizona. The field will be located on the Parada grounds and will be made into a first class airport.

A CHAIN of flying schools throughout Arizona is planned by Charles Mayse, George D. Huffman and Pete Schilling, of Tucson. Mayse and Huffman are the Tucson distributors for the Lincoln-Page planes and also operate an airport and flying school in that city.

Mayse has recently increased the size of his field by 80 acres which will make it a 160-acre field, located on paved highway directly south of Tucson.

Phoenix-Prescott Airline

A DAILY airplane passenger service operating between Prescott and Phoenix, Arizona, will be inaugurated soon by the Apache Aircraft Corporation.

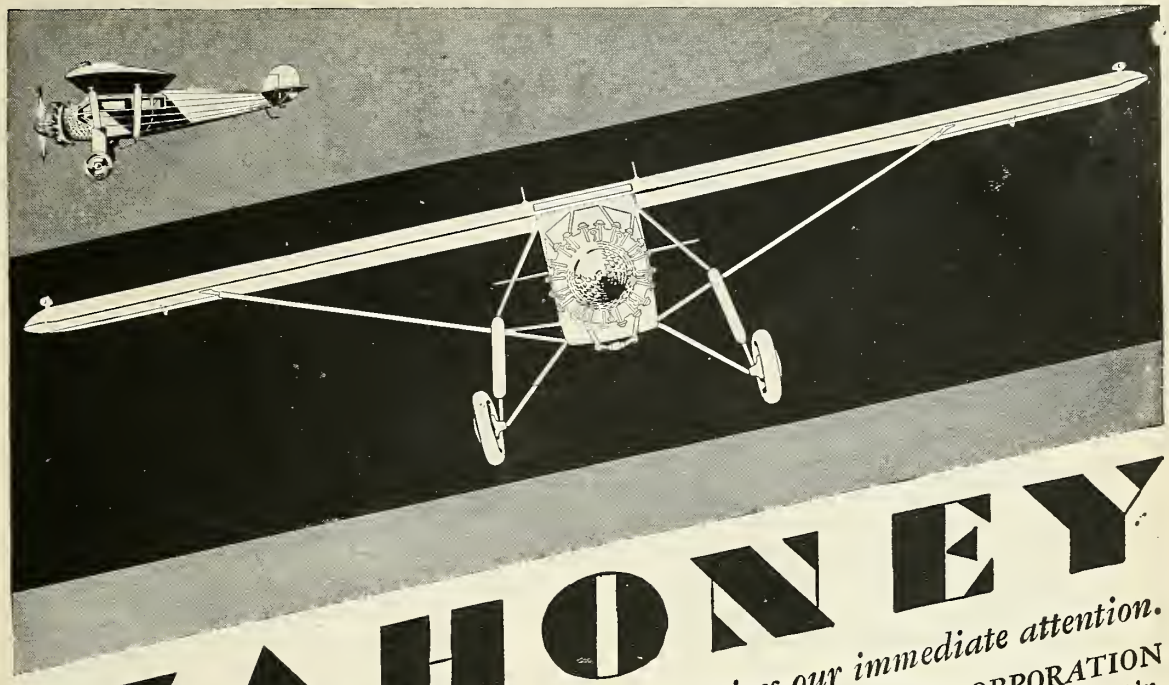
The incorporators of the new company are: G. V. Hays, Dr. Thomas W. Woodman, F. H. Jolley, W. L. Nelson, Dr. Floyd Sharp, and Melvin Van Vorst, all of Phoenix.

The Brown Mercury planes built in Los Angeles by L. W. Brown will be used.

MONTANA AIR NEWS

THE Mid-Continent Aircraft Corp., Miles City, Montana, has obtained a contract for distributing the Travel Air airplanes in the state of Montana. Dealers will be appointed in various sections of the state.

Frank Wiley, chief pilot of the Yellowstone Flying School, is the president of the corporation and is well known in flying circles on the west coast, having flown for the Mahoney Aircraft Corporation at San Diego and the American Aircraft Company, Waco dealers on the Pacific Coast.



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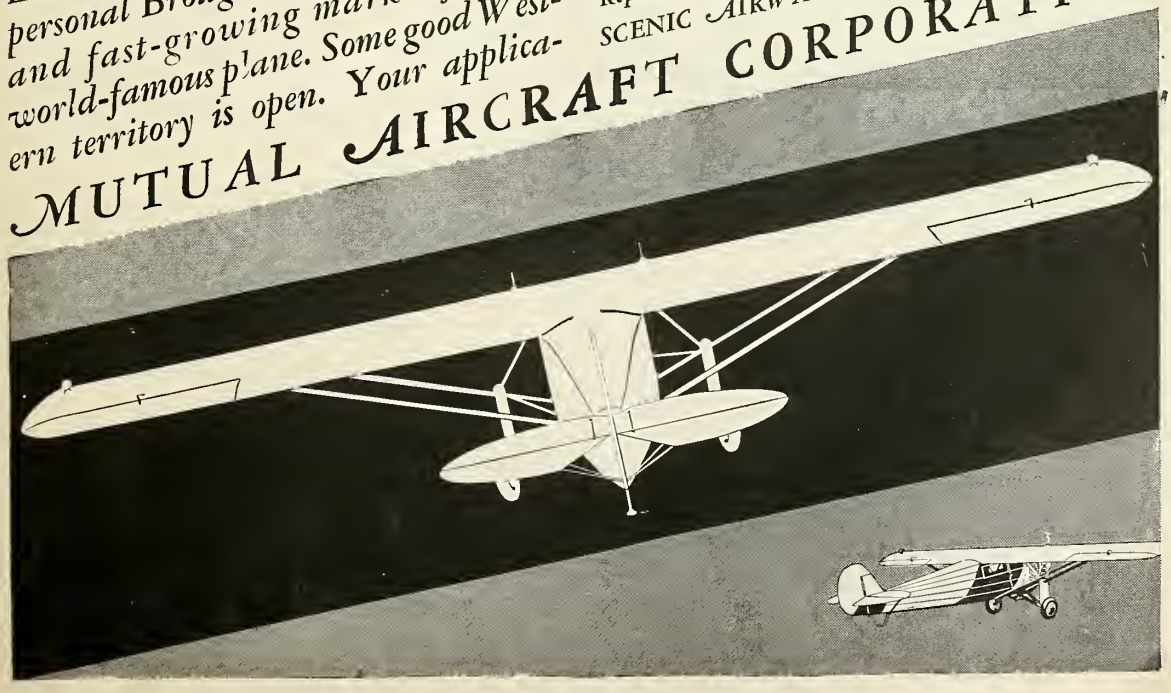
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NORTHWEST AIR NEWS

By F. K. Haskell

A NEW triangular air route will shortly be in operation, with a daily round-trip service between Victoria, Vancouver and Seattle, with the advent of Western Canada Airways, Ltd., of Winnipeg into the British Columbia air field.

Included in the personnel of the Canadian company are John Hunter, secretary, and Major D. R. MacLaren, managing director of the Pacific Airways, Ltd., of Vancouver, which company has recently been taken over by the Western Canada Airways, Ltd.

WITH Governor Roland H. Hartley and Valentine Gephart as speakers, the Everett Airport was formally dedicated at Everett, Wash., during the latter part of April. The dedication was followed by a program of races and stunts.

Tex Rankin of Portland won the stunting contest. The spot landing went to Don Phillips of Tacoma. Omar Drury of Seattle won the twenty-five mile feature race.

AN aerial survey of Alaska was made in May by Governor George A. Parks, Malcolm Elliott, president of the Alaska road commission, and R. J. Sommers, territorial highway engineer. The purpose of the flight was to obtain data for aiding development of the airplane as a standard means of transportation in that region.

The party left Fairbanks on the two-weeks' trip over the Koyukokwin regions. The territory already has 48 fields and plans are under way to construct 6 more this year.

AN air circus will be held at Centralia, Wash., August 9th under the auspices of the American Legion. National Guard, Naval Reserve and a large number of commercial planes from Oregon and Washington fields will take part.

THE new 80-acre airport at Yakima, Wash., will be fittingly dedicated on June 9th, and $1,000 in prizes have been secured for a series of airplane races. A. L. Daring has formed an aviator's club which will finance the meet. Ernest Schneider, chairman of the airport committee, will have charge of the entries in the races, which will be open to all planes powered with OX-5 motors.

THE Grays Harbor Airways Company has been incorporated and has commenced construction of a modern airplane factory at Aberdeen, Wash. At a recent meeting attended by some 30 stockholders a board of seven trustees was elected including Carl Morck, president; Thomas J. Grant, secretary-treasurer; Frank Burrows, vice president; W. J. Dinsmore, Dewey Wilson, John T. Egan and W. C. Daniels, trustees.

MAJOR JOHN F. "JACK" FANCHER, nationally known flier and well known in many walks of life in and around Spokane, Wash., died April 30th at Wenatchee, Wash., as the result of premature explosion of an air bomb. He had brought the 41st Division Air Service Unit of the Washington National Guard from Spokane to take part in the annual blossom festival here.

WASHINGTON AIR NEWS

By C. M. Litteljohn

DISCONTENTED with the manner in which work on Seattle's municipal airport at Georgetown has lagged, aviation leaders in Seattle descended on the King county commissioners on May 14th and demanded swift action in the completion of the landing field. Disagreement within the ranks of the commission has delayed work on the field.

Plans for the airport include a long central runway, 8,000 feet long by 300 feet wide, as well as three other runways in different directions of 3,600 feet, 2,800 feet, and 2,600 feet long by 150 feet wide. The airport comprises about 425 acres, portions of which have been filled in and levelled off, located near the Boeing airplane plant.

REAL estate in Seattle is now being sold by airplane. The Kennard White organization places a plane at the service of all those within a radius of 200 miles of the city who want to fly to the north end of Seattle and look at a lot.

THE Bergen-Bromley Flying Service is a new concern recently incorporated at Tacoma, Wash. The service plans to establish a branch flying school at Olympia's new $35,000 airport. Bergen saw war service overseas, and won the prize in the Spokane air derby last year. Bromley was with the Royal Air Force of Canada during the war, and majored in aerial navigation at Oxford.

(*Continued on next page*)

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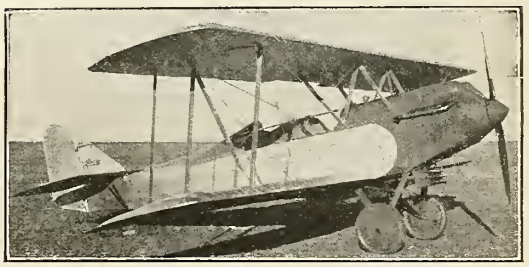
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(Washington Air News continued)

P. G. JOHNSON, president and manager of the Boeing Airplane Co., at Seattle was one of the principal speakers at the annual meeting of the Washington Manufacturers' Association at Yakima, Wash. during May.

WITH a spectacular air circus, dedication of the new airport for Wenatchee, Wash. was arranged during the time of the holding of the 9th annual Apple Blossom Festival, with the trees of this apple valley all in bloom. Illuminated flying was a splendid feature of the nocturnal events of the festival.

CHARTING fire hazards, a new use for airplanes in the Pacific Northwest, with its vast timbered regions, will be undertaken in planes by the Northwestern Mutual Fire Association of Seattle. This company, according to A. Y. Baker, assistant to the president, will make airplane surveys of the entire western half of the United States and Canada and chart fire hazards from the air.

THE Tulip Festival at Bellingham, Wash. in May was rendered more attractive and interesting this year by the numerous planes in the air during the festivities.

CAPTAIN JOHN J. BOUEY, British ace, expects to have the new West Coast Aviation Corporation of which he is president and general manager in full operation in June.

Flying instruction and ground school work will be offered in addition to having the distributorship for the state of Washington and Oregon of the Stiles Dragonfly monoplane.

The incorporators of the company, besides Captain Bouey, are J. P. Byrne, and F. E. Wubbena.

IN July a 10-million candlepower aviation beacon will be completed in Seattle according to J. L. Valentine, district sales manager of the Standard Oil Company of California. This beacon will be placed atop a 75-foot steel tower, and will revolve six times a minute. It will be furnished by the oil company to encourage commercial aviation.

EQUIPPED with new Thunderbird planes, the Star Air Line, Inc., one of the newest air transportation companies of Seattle, of which James E. McAuslan is president, has recently begun its courses of flying instruction.

VERN C. GORST has a new flying boat, built by the Boeing company, which his daughter, Miss Myrtle Gorst, student at the University of Oregon, has just christened "Zephr". The boat has a compartment for four passengers beside the pilot and is luxuriously equipped.

COL. HARRY V. WURDEMANN, of the Seattle Medical Officers' Reserve Corps, has recently completed a course in aviation medicine at Brooks Field, San Antonio, Texas, which qualifies him as a "flight surgeon".

THE Washington Flying Service has recently been incorporated at Tacoma, Wash. A. B. Holden and Robert D. Abel are the incorporators.

THE first letter to circle the world by air arrived back in Seattle May 3rd. It was mailed at Seattle on February 16th.

SPOKANE AIR NEWS

ORDERS for delivery of another Douglas 02 military airplane to the 41st division air service unit, Washington National Guard, Felts Field, Spokane airport, were received recently from the War Department by Lieutenant C. V. Haynes, regular army flying instructor at Spokane. Addition of the Douglas 02 will raise the military fleet to three Douglas planes, two of the PT training type and the De Havilland plane used by Lieutenant Haynes.

AIR express service soon will be offered Spokane along with other cities of the northwest, according to A. H. Peterson, general agent in Spokane for the American Railway Express Company. Packages for the air express will be gathered at Vancouver, Wash., and a plane will leave from there at 7 o'clock each morning, except Monday. Packages may be delivered at the Spokane express office as late as 8 at night and go by train to Vancouver for the plane the following morning. The plane will arrive in San Francisco at 1 the same day and at Los Angeles at 6:15.

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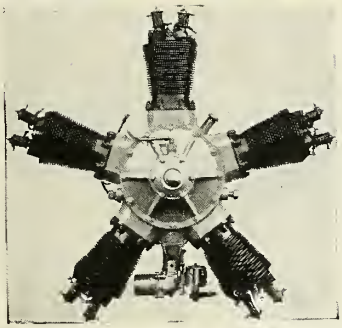
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UNIVERSAL INSTITUTE OF AERONAUTICS, Inc.

THE SUCCESS WHICH HAS ACCOMPANIED THE ESTABLISHMENT OF THE UNIVERSAL SCHOOL OF AERONAUTICS DEMANDS ITS EXPANSION IN A NUMBER OF WAYS. THE UNIVERSAL INSTITUTE OF AERONAUTICS HAS BEEN INCORPORATED, THEREFORE, TO CARRY ON INSTRUCTION IN AERONAUTICS ON A MUCH BROADER SCALE AND WITH A LARGER STAFF. THERE WILL BE NO LOWERING OF THE HIGH STANDARD HERETOFORE MAINTAINED.

T. CAMERON WILKINSON
President

1861 Rodney Drive Hollywood, California

AERO CORPORATION of CALIFORNIA
of Los Angeles

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CALIFORNIA *and* ARIZONA

NEWS OF THE AIR SERVICES

ARMY AIRSHIP LANDS ON SHIP'S DECK

THE Army Air Corps' non-rigid airship TC-5, on May 10, made a successful landing on a platform on the afterdeck of the steamer *American Trader* three miles off Ambrose Light en route to England with passengers and freight. A passenger was transferred from the steamer to the airship, the landing lines were cast off and both vessels continued on their way the steamer heading for Plymouth, while the airship turned and flew back to the Naval Air Station at Lakehurst, N. J. This is the first time that an airship has landed on the deck of a merchant vessel.

SEAPLANE ENDURANCE RECORD BROKEN

A NEW seaplane endurance flight record was established at the Philadelphia Navy Yard on May 5, exceeding by nearly 8 hours all existing world records for sustained flight. Official records of the flight, checked from two barographs by an official of the N. A. A., showed that the seaplane, carrying 19,000 pounds of weight, had remained in the air for 36 hours, 1 minute and 13.8 seconds.

The ship took to the air at 3:50 p. m., on May 3, and in the time it was aloft traveled approximately 2,500 miles.

The four men who established the new record are Lieutenant Arthur Gavin, U.S.N., winner of the Schiff Trophy for safe flying and one of the pilots in the first Pacific flight commanded by the late Commander Rodgers; Lieutenant Zeus Soucek, holder of a number of flying awards; Aviation Mechanic J. C. Proley, of the Philadelphia Navy Yard's airplane factory, and H. F. Dayton, of the Wright Aeronautical Co. Gavin and Soucek alternated at the controls every two hours, and Proley and Dayton alternated at the gas tanks.

The seaplane used in establishing the new record was the PN-12, equipped with two Wright Cyclone air-cooled engines.

The previous seaplane endurance record also was established in Philadelphia at the Navy Yard. Lieutenants C. H. Schildhauer and J. R. Kyle set the old mark of 28 hours, 35 minutes and 27 seconds in the PN-9 on May 1 and 2, 1925.

LT. SWEELEY MAKES DAWN-DUSK FLIGHT

LIEUT. WILLIAM R. SWEELEY is believed to have set a new American record for a dawn-to-dusk flight in a service plane on May 23.

Flying a new Curtiss Falcon ship with a 12-cylinder 460 horsepower engine, Lieut. Sweeley covered 1,525 miles from Buffalo to Galveston in 13 hours and 25 minutes. He stopped for fuel at Louisville and Memphis. He left Buffalo at 3:15 a.m. (Central Standard time) and arrived at 4:40 p.m. (Central Standard time) at Galveston.

Lieut. Sweeley is a member of the Third Attack Group, stationed at Fort Crockett, Galveston.

The First Pursuit Squadron flew from Selfridge Field, Michigan, to San Antonio last year, but that distance is shorter than the Buffalo-Galveston flight.

LUTZ WINS CURTISS MARINE TROPHY

MAJOR CHARLES A. LUTZ, 47-year old Marine Corps flier, commanding Brown Field at Quantico, Va., won the Curtiss Marine trophy race at Anacostia Naval Air Station on May 19. Piloting his Pratt and Whitney engined Curtiss Hawk, equipped with pontoons, in the race for VF fighting planes at an average speed of 157.56 m.p.h. over the 100-mile course, the Major flew a remarkably consistent race. He finished with an elapsed time of 38 minutes 4.2 seconds.

Lieutenant Commander C. C. Miles, of the Anacostia Naval Air Station, finished second, piloting a Curtiss Hawk at an average speed of 154.7 m.p.h.

Captain Harold C. Major, Marine Corps flier attached to the Bureau of Aeronautics, finished third with a speed of 151.81 m.p.h.

In the race for VO general purpose, fleet spotters, Lieut. Commander W. R. Harrill, of the Navy Department, won with a speed of 149.61 m.p.h. He was flying a Vought two-place observation-fighter equipped with a Pratt and Whitney Wasp.

The winner of the VO general purpose, amphibian type, race was Lieut. B. E. Grow, of Hampton Roads, at 116.9 m.p.h.

Lieut. D. V. Galleny, of the Scouting Fleet, came in first in the VT torpedo, bomber, race—speed, 105.62 m.p.h.

In the race for VN training planes, Lieut. W. G. Tomlinson, of Anacostia, won with a speed of 92.38 m.p.h.

The race consisted of five laps over a twenty-mile course, starting opposite the Naval Air Station at Anacostia and extending down the Potomac River.

ARMY PLANES FLY TO RESCUE "BREMEN"

TWO Army Loening amphibians took off from Mitchel Field on the morning of May 12 under the personal supervision of Major General James E. Fechet, Chief of the Air Corps, to transfer to New York the *Bremen*, the Junkers monoplane which has been isolated on the Labrador mainland near Greenely Island. The planes were piloted by Captains Ira C. Eaker and Muir S. Fairchild and carried in addition to Major General Fechet, pilot Fred Melchior of the Junkers Company.

In spite of the enthusiasm and skill displayed by the rescue group the trip proved to be luckless. At St. John, N. B., Captain Fairchild became ill and had to be substituted by Lieut. Quesada, who was hurried from Boston. Snowstorms and fog delayed the planes until they reached St. Georges, N. F. Before the final hop to Greenely Island there was still another delay due to inclement weather but on May 19 they circled around the transatlantic plane, since it was impossible for them to land on account of the ice floes, and pilot Fred Melchior was safely dropped by parachute near the plane.

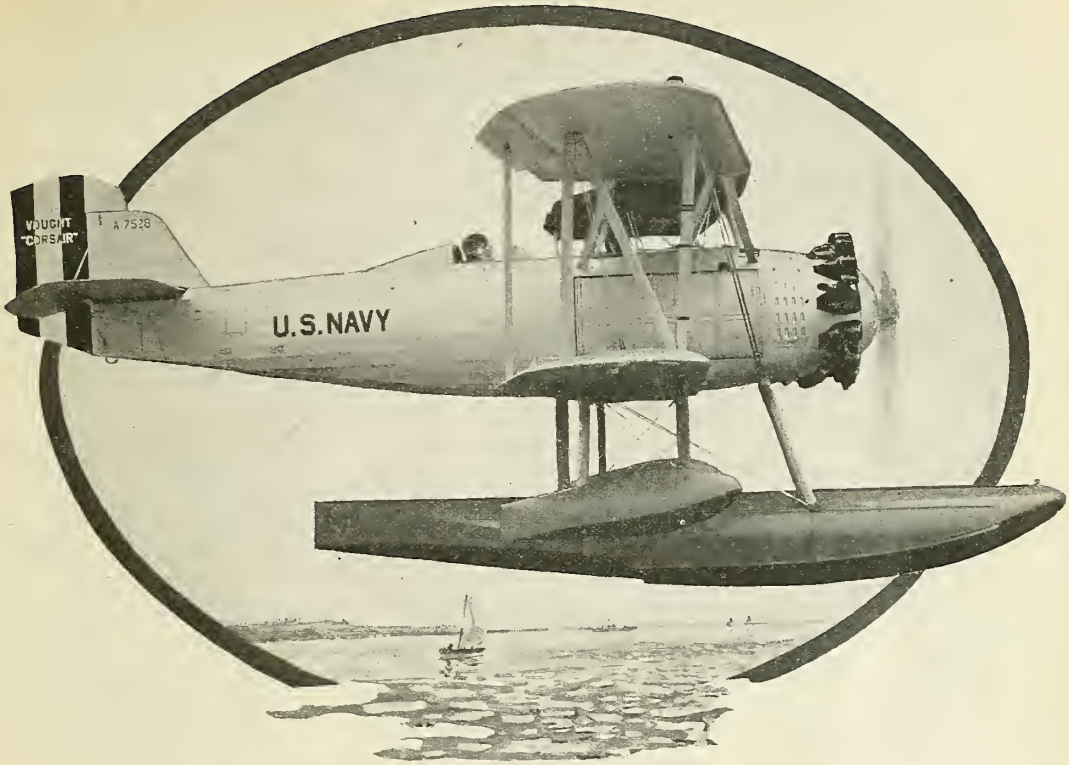
The *Bremen* had been put in readiness for Melchior by Dr. Louis Cuisinier and his mechanic Thibault of the Canadian Trans-Continental Airways. On the take-off from the temporary runway the plane was badly damaged. No further attempts will be made to fly the *Bremen* to New York but it will be transported to New York by steamer.



Acme.

Army Air Corps Expedition preparing to fly to rescue the "Bremen"

Lt. Fairchild, Fred Melchoir, Maj. Gen. Fechet, Cy Caldwell, who aided the expedition with information on the territory to be flown over, and Capt. Eaker.



BULLET-EVADING AIRPLANES

Maneuverability and controllability are the most important characteristics of fighting airplanes. Speed is essential, but without maneuverability it will not produce the best *bullet firing* and *bullet evading* airplanes.

These were the attributes of the successful fighting planes during the last war, which were created by designers maintaining the closest contact with operating conditions at the front, and will continue to be the most important characteristics of planes used in all future wars.

In the Vought "Corsair," and in all Vought creations, maneuverability and controllability are the paramount characteristics.

CHANCE VOUGHT CORPORATION
LONG ISLAND CITY, NEW YORK

THE AERONAUTICAL INDUSTRY

C. A. M. BIDS AWARDED

THE Robertson Aircraft Corporation, of St. Louis, Mo., has been awarded the contract for operating the air mail route from St. Louis, via Kansas City, Mo., to Omaha, Neb., and return. The bid of this firm which was the lowest received, was for 78 and one-half cents a pound. This is the lowest rate for carrying the mails over any route at present in existence.

The Thompson Aeronautical Corporation, of Cleveland, Ohio, was awarded the contract for carrying the mails by air over the route from Chicago, Ill. to Kalamazoo, Mich. via South Bend, Ind., to Bay City, via Lansing, Flint and Saginaw, with spurs branching out from Kalamazoo to Pontiac, via Battle Creek, Jackson, Ann Arbor, and to Muskegon, via Grand Rapids. The bid of this firm was 89 cents a pound.

The route from St. Louis to Omaha will not be placed in operation for several months as it will require the lighting of the airway for night flying. The route from Chicago to Indiana and Michigan points will commence operation during the early part of the summer or just as soon as the contractor can make arrangements for landing fields and place his equipment in condition for mail carrying.

J. C. TEN EYCK SALES MGR. FOR STANDARD STEEL PROPELLER CO.

J. C. TEN EYCK, JR., has been appointed sales manager of the Standard Steel Propeller Company, Homestead, Penna.

Standard Steel propellers are now installed on many U. S. Army and Navy planes, and have been used on many of the famous American planes that have made aviation history during the past few years. A few notable flights made with these propellers are:

Col. Charles A. Lindbergh—San Diego to New York to Paris, tour of United States and Pan-American flight; Alaska Survey—mapping of Alaska, 1926-1927; Art Goebel—San Francisco to Hawaii, winner of Dole Flight; U. S. Army Good-Will Flight—five Amphibian planes, visiting 18 countries in Central and South America, 30,000 miles; Stinson-Haldeman—world's endurance record, 53 hours, 15 minutes; Lieut. C. C. Champion—altitude record—38,474 feet, July, 1927; Lieut. A. J. Williams—unofficial speed record—334 miles per hour; Trimotor Fokker planes—Anacostia, D. C. to Nicaragua; Ruth Elder-George Haldeman—transatlantic flight; Commander Byrd's plane—for South Pole Expedition; "Queen of Yukon"—service between Dawson and Yukon; Capt. Hood and Lt. Moncrieff—non-stop flight from Australia to New Zealand, January, 1928.

WARNER ENGINE IS NOW IN PRODUCTION

THE 110 horsepower radial air-cooled Scarab engine, manufactured by the Warner Aircraft Corporation of Detroit, Mich., is now in production. The engine was described and illustrated in the April issue of AERO DIGEST.

The following well known men constitute the directorate: Chas. B. Bohn, president, Bohn Aluminum & Brass Corporation; Newton Skillman, president, O. & S. Bearing Company; Wm. B. Stout, manager, Aeroplane Division, Ford Motor Company; Nelson Hartwick, president, Hartwick Lumber Company; W. Magruder Jones, vice-president, Guaranty Trust Company; W. O. Warner, vice-president, Warner Aircraft Corporation.

The officers of the Warner Aircraft Corporation are: Newton Skillman, president and general manager; W. O. Warner, vice-president and chief engineer; Nelson Hartwick, treasurer; W. J. Jarvie, secretary.

LOWER AIR MAIL RATES

AIR MAIL postage rate of five cents an ounce instead of ten cents a half-ounce, and power to readjust terms of air mail carriage are vested in the authority of the Postmaster General under a new act (H.R. 8337), which President Coolidge has just signed.

CURTISS-REED PROP. MAKES WORLD RECORD

WORD has been received by S. A. Reed, inventor of the Curtiss-Reed metal propeller, that the world's speed record of 318 miles an hour, recently established by Major Mario de Bernardi of Italy in a Macchi seaplane, was made with a Curtiss-Reed forged type metal propeller built by the Curtiss Company at Garden City, and modified in accordance with special designs of Mr. Reed. This adds another record to the long string of world's speed records that Curtiss-Reed propellers achieved.

NEW STOPS ON AIR MAIL ROUTES

EFFECTIVE June 3, Toledo, Ohio, will be made a stop on the trans-continental air mail line. On June 4, 1928, Detroit, Mich. will become a stop on the New York-Chicago overnight service through connection at Cleveland, Ohio.

Westbound, the transcontinental plane will stop at Toledo at 5:10 p.m. Eastbound the plane will stop at Toledo at 11:15 a.m.

The overnight New York-Chicago plane will be due at Detroit at 5:30 a.m. The plane from Detroit for New York will leave Detroit at 10:05 p.m.

D. F. C. AWARDED TO TRANSATLANTIC FLIERS

PRESIDENT COOLIDGE on May 2 presented the Distinguished Flying Cross to Baron Gunther von Huenefeld, Major James C. Fitzmaurice and Captain Herman Koehl in recognition of their "exceptional skill and resourcefulness in succeeding in making the first westward trans-atlantic flight from Europe to North America."

The Senate recently passed a bill authorizing the President to present Distinguished Flying Crosses also to Captain Dieudonne Costes, Lieutenant Commander Joseph Lebrix and Colonel Francesco de Pinedo. The Senate also favors awarding gold medals to Colonel Charles A. Lindbergh and Lincoln C. Ellsworth.

NEW AIRLINE ROUTES and SCHEDULES

THE following new airline schedules and changes in schedules have been established since the May issue. A complete list of mail, passenger and express airlines was printed in the December issue. New lines opened since that date or new schedules have been added in each succeeding issue.

Air Mail—Passenger—Express

C. A. M. 26—ALBANY, N. Y., SCHENECTADY, N. Y., UTICA, N. Y., SYRACUSE, N. Y., ROCHESTER, N. Y., BUFFALO, N. Y., CLEVELAND, OHIO. Operated by Colonial Air Transport, Inc.

Time Table

Westbound (Read down)			*Eastbound (Read up)*	
10:09 a.m.	Lv.	Albany, N. Y.	Ar.	6:13 p.m.
10:24 a.m.		Schnectady, N. Y.		6:03 p.m.
11:17 a.m.		Utica, N. Y.		5:12 p.m.
11:54 a.m.		Syracuse, N. Y.		4:36 p.m.
12:54 a.m.		Rochester, N. Y.		3:39 p.m.
1:55 p.m.		Buffalo, N. Y.		2:50 p.m.
4:15 p.m.	Ar.	Cleveland, Ohio	Lv.	12:20 p.m.

Reservations and Information: Colonial Western Airways, Inc., Ten Eyck Hotel, Albany.; Colonial Western Airways, Inc., 270 Madison Ave., New York City.

Passenger Line

CHATTANOOGA, TENN., ATLANTA, GA. Operated by Tennessee Air Transport Co., Inc.

Time Table

Southbound (Read down)			*Northbound (Read up)*	
8:00 a.m.	Lv.	Marr Field, Chattanooga, Tenn.	Ar.	3:30 p.m.
9:15 a.m.	Ar.	Candler Field, Atlanta, Ga.	Lv.	2:15 p.m.

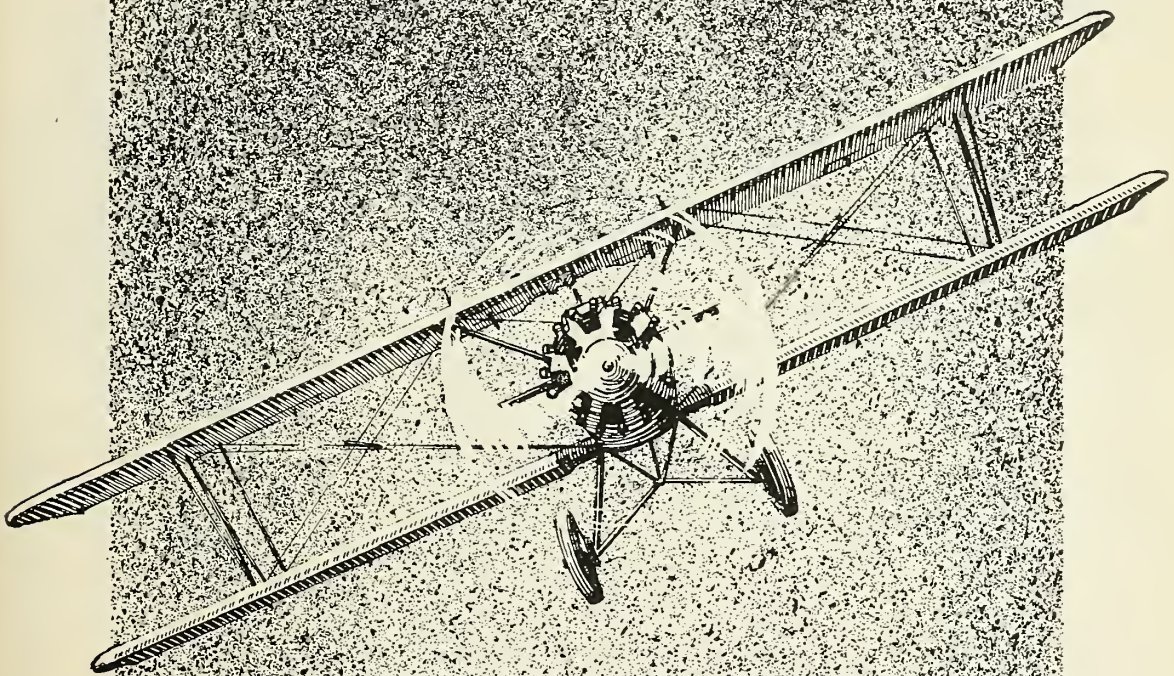
Operating on reservations only daily except Saturday and Sunday.

Passenger Rates

Round trip, $30 (returning same day); One way, $17.50.

Reservations and Information: Tennessee Air Transport Co., Inc., Marr Field, Chattanooga, Tenn.—Hemlock 407.

The Consolidated Courier



Consolidated Aircraft Corporation
Buffalo, N.Y.

CONSOLIDATED AIRCRAFT

DETROIT AIR NEWS

By Frank Bogart

SIX young men from Michigan will take advanced flying training in the Naval Reserve at Pensacola, Fla., this summer and will then be commissioned in VN Squadron 9, stationed at Detroit. Four of these named are from Detroit: Talbott Bernard, Frederic A. Brossy, John Glover and Richard C. Mertz. The others are E. O. Billings of Kalamazoo and Lawrence Bennett of Grand Rapids. They have been taking class room work the past year at the University of Michigan under the squadron's officers. Before going to Pensacola they will take a short preliminary course at the Great Lakes, Ill., training station. They were selected out of a class of more than 100 students. Squadron 9's new hangars are now being completed on Grosse Ile, an island in the mouth of the Detroit river.

ONE of the first commercial airplane service stations in Michigan is now being organized by the Triangle Flying Service at its field one mile east of Plymouth, between Detroit and Ann Arbor, and about 20 miles from the former. George Tabraham is chief pilot of this organization. Hangars and shops are now nearly completed. Special tools and machinery will be installed for all sorts of work, from steel tube welding to valve grinding. Flying instruction and cross-country flying is now being carried on by the Triangle organization in Waco and Driggs planes.

THE Stout Air Services, Inc., reported the biggest month in its history on the airline to Cleveland in April, with 732 passengers, and more than 3,000 riders taking the short 15-minute aerial tours over Detroit. The traffic during May was keeping up to this high average.

THE Wayco Air Service, of which Edward F. Schlee, Detroit to Tokio flier is president, has become distributor for Bellanca planes in Michigan and will soon arrange to distribute them in adjoining states as well. Schlee and his pilot, William S. Brock, will give almost their full time to this new endeavor this summer. The pair made the first entry for the 1928 National Air Tour.

NATIONAL Air Tour Officials and several Detroit newspapermen departed May 21 in a Fokker trimotor plane loaned by the Army Air Corps to make the annual "pathfinder" tour in advance of the start of the fourth contest for the Edsel Ford Reliability Trophy. They will cover the 6,200-mile route touching 24 cities in 13 states from Michigan to Texas to California to Washington and back through Montana, North Dakota, Minnesota, Wisconsin and Illinois. N. R. Cooper, manager, and Ray B. Collins, who has refereed all the trophy contests, headed the party. Lieutenant Peter Skanse, Bolling Field, Washington, D. C., was in charge of the flight.



Henry Miller photo.

M. Hamburg of the Airplane Model League of America and several champions demonstrating their model planes to President Coolidge

CAPTAINS CARL C. SQUIRES and Clement W. Brown, of the 107th Aero Squadron, M. N. G., have completed successful flight tests of a new aero coupe which is to be put into production by a new Detroit manufacturing company in which they are interested, the Aerocraft Manufacturing Company. Their machine was shown at the recent All American Aircraft Show and is now up for an approved type certificate from the Department of Commerce. It is a four-passenger biplane, with convertible cabin.

THE NATIONAL MODEL AIRPLANE CONTEST

MORE than a thousand boys from every place in the United States between Portland, Maine, and Honolulu are expected to participate in the National Model Airplane Contests to be held in Detroit, June 29-30 by The American Boy Magazine. This magazine, which organized the Airplane Model League of America, has been designated by the National Aeronautic Association to conduct the contests for the Stout Indoor Trophy, the Mulvihill Outdoor Trophy and the new scale model competition.

Jack Loughner of Detroit is the present holder of the Mulvihill Trophy, and Charles Dybvig, Detroit, of the Stout Trophy. To stimulate interest in these contests, The American Boy has offered trips to London, Paris and Geneva to boys under 21 years in the 1928 contests. AERO DIGEST has arranged to take the winner of the scale model contest, to be held for the first time this year, to Los Angeles to attend the National Air Races. There are also $3,000 in cash prizes and 198 medals to be presented.

Many of the entrants in the contest will be sent to Detroit as official representatives of the cities or districts in which they live, through the fifty-three newspapers coöperating with The American Boy in the promotion of the contests. Each of these papers is to hold preliminary contests to select its own champions. Any model builder in the United States may enter the national tourney, however. The cost will be approximately $20 for the two-day meet—this to cover transportation, hotel, meals and all such expenses. Plans are being made to obtain reduced rail rates from the railroads, so that every person attending the meet should apply for a certificate when buying his ticket to Detroit.

Contestants may obtain entry blanks from any of the newspapers conducting local contests, or from the Contest Director, The American Boy, 550 Lafayette Boulevard, Detroit, to whom entry blanks should be returned not later than June 20. It is planned to charge a small entry fee, which will be returned when the contestant actually enters a model in a contest. Scale models may be shipped to the same address, express prepaid, if they are sent by June 14; thus it will be possible for builders to enter one of the three contests without being actually on the ground. For flying contests, however, builders must handle their own machines.

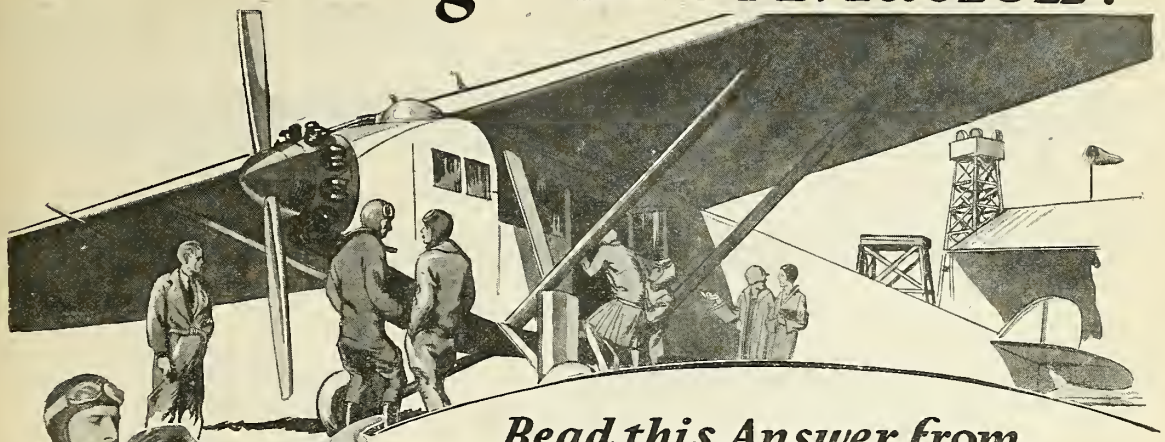
On arrival in Detroit, entrants should go to the Statler Hotel, contest headquarters, where reservations will have been made. Here an information bureau will be established, and complete arrangements to handle publicity will be made. Indoor contests to select finalists will be held at the Olympia, Detroit's "Madison Square Garden," on Friday; outdoor semi-finals at Selfridge Field, near Detroit. Friday evening will be reserved for a banquet to be given by Edsel Ford at the big hangar at Ford Airport in honor of the young model builders and such visitors as Commander Richard E. Byrd, Orville Wright, Clarence Chamberlin, Eddie Stinson and other notables who plan to be present.

On Saturday all contestants will go to Ford Airport to inspect the field, view the famous planes there and watch the start of two of the world's greatest aeronautical events,—the James Gordon Bennett International Balloon Race and the Ford National Reliability Tour. Finals in the outdoor model contests will be held late in the afternoon.

Saturday evening finals for the Stout indoor contests will be held at the Olympia. Then, at midnight, a second banquet will take place at the Statler Hotel. Here Griffith Ogden Ellis, editor of The American Boy and general chairman of the two days' events, will present the Stout and Mulvihill Trophies and announce the winners of the scale model contest and the three free trips.

All information about the contest may be obtained from the Contest Director.

"How can I get into Aviation?"



Read this Answer from

A World Famous Trans-Atlantic Pilot



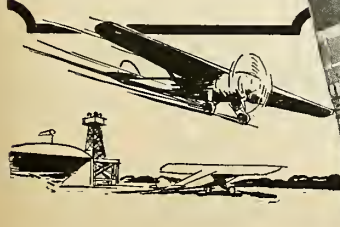
Aviation is waiting for no one! Too many millions of capital are already invested—the demand for air service of *every* kind is increasing too fast. Aviation demands men who KNOW. Men who can DO. Men who can step into the real jobs and command the real salaries. Plane production today is *ten times* what it was a year ago. And a year from now it will be twenty times what it is today! Landing fields, municipal airports, plane and equipment factories, air mail and passenger lines, service and sales organizations—all are leaping ahead in the fastest, most amazing development that any industry has ever known. In such racing, feverish activity, *where* is there any room for a man who has nothing to offer? An empty pocketbook is no drawback—but aviation has no place, no patience, no *time* for empty hands or empty heads! Aviation is taking off for the greatest non-stop flight in history—and the men who will go along and climb to the top are the men with a foundation of FACTS under them.

Walter Hinton

The man who is ready to help YOU get into aviation is the man who has *four times* been one of the world's outstanding flyers. Walter Hinton was pilot of the famous NC-4, first plane to fly the Atlantic; he piloted the first plane from North to South America; he was first to fly to the headwaters of the Amazon; he was the hero of the runaway Navy balloon that was swept halfway to the North Pole. But in addition to being an explorer, pioneer and aviator, Hinton also has the rare ability to teach *others* the knowledge he has gained. During the War he was a crack flying instructor for the Navy. Today—with a course that experts agree is the most complete and practical ever produced—Hinton is training keen-sighted men for the Big-Pay jobs in aviation.

Get his FREE Book

This FREE Book is YOUR first step to Success. Take this step—send for this book *—NOW!*





You Don't Have to Fly; 40 Different Jobs on the Ground PAY BIG too!

To succeed in aviation—make BIG MONEY—you need not necessarily be a pilot. There must be many thousands of pilots, certainly. But for every plane that flies, there's an immediate need for trained men in more than *forty* different important jobs on the ground. Construction, motor and instrument experts—airport managers, service foremen, salesmen—all make *real* money. Some of them even bigger pay than pilots earn. But every last one of them must have the FACTS. Today's problem—YOUR problem—is to LEARN aviation quickly. And right there is where Walter Hinton is achieving the biggest success of his career.

Choose Your Job

(Here are a Few of the 40)

Designer and Engineer, Pilot, Engine and Plane Mechanic, Rigger, Wire Worker, Electrician, Welder, Instrument Maker, Wood and Metal Worker, Draughtsman, Plane and Motor Inspector, Airport Operator, Radio Expert, Assemblyman, Aerial Surveyor and Photographer, Aerial Transport Manager, Salesman.

Get Your Ground Work NOW, Right at Home—Hinton Is Ready to Train You

You can train at home in spare-time for the best paid jobs in the Industry. Hinton's proved course starts you at the beginning, trains you fast. You get *all* the facts about construction, rigging, motors, repairs, instruments, theory of flight, navigation, commercial aviation—facts that *every* man must have to intelligently and profitably fill ANY job in the Industry. With this Institute's training you'll have your foundation, your *start*, for real accomplishment. Serious-minded—*air-minded*—men are reading and *acting* on the Free Book shown below. I want YOU to have a copy, too! Send the coupon NOW.

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DETROIT AIR-OLYMPICS

FORD AIRPORT, JUNE 30

THE first public exhibition of glider flying in Michigan will be staged in connection with the Detroit Air-Olympics, to be held at the Ford Airport on June 30. It will be made by a team from the Cass Technical High School, under the direction of Harry Karcher, an instructor in aeronautics. The machine has been christened the "Kasstek" in honor of the school. It was built under Karcher's direction by members of his class.

The latest addition to the Air-Olympics program makes the event even more important from the aeronautical standpoint. It is the hope of the Detroit Board of Commerce, which is sponsoring the great air program, to make the Olympics a comprehensive picture both of past progress and the present high state of commercial aviation.

The first major event of the day will be the start of the National Air Tour, with a score or more of airplanes setting off on a 6,000-mile reliability race to the Pacific Coast and return. The first plane will take off at 10:00 a. m., followed by the others at small intervals. From then on, a continuous round of events will make the day the greatest in the history of aviation.

The whole world will watch with interest the outcome of the Gordon Bennett International Balloon Race. Sixteen pilots from eight countries are coming to Detroit for this classic contest. America has won the Bennett trophy two years in succession; a victory this year would mean permanent possession of the cup. After the start of the balloon race will come the Boys National Model Airplane Contest, followed in turn by an air circus to be presented by the fliers of the First Pursuit Group at Selfridge Field.

"We hope to show the people of Michigan just how practicable gliding is," A. D. Althouse, in charge of the automotive department at the Cass School explained. "The glider to be used in the Air-Olympics was made by our students at a cost of $25. It weighs 40 pounds and will support a man weighing 150 pounds at 20 miles per hour air speed. It is of biplane construction, with a 20-foot wing spread, and the fuselage is 15 feet long."

Interest among Detroit boys is so keen, Althouse said, that there has been organized the American Glider Association. Membership is growing rapidly and seven additional gliders will be constructed to afford training to all members.

A. S. M. E. AERONAUTIC MEETING AT DETROIT

ARRANGEMENTS have been made, in cooperation with the Airplane Model League of America and with the committees sponsoring the racing events at the Ford airport, to hold the National Aeronautic Meeting of the Aeronautic division of the American Society of Mechanical Engineers in Detroit on June 28, 29 and 30. Besides the very valuable technical conferences that have been arranged at which outstanding authorities will speak, social events of interest have also been planned.

17TH INTERNATIONAL BALLOON RACE

For Gordon-Bennett Trophy

SIXTEEN pilots from eight countries have entered the 17th International Gordon-Bennett balloon race, including entries from Denmark and Argentine—two countries which never before have competed in this race. Three balloons each will represent the United States, Germany, France and Belgium while England and Switzerland will send one each. The American entries will be picked at the National Elimination Contest to be held in Pittsburgh on May 30th.

The 1927 race was won by two Detroiters, E. J. Hill and A. G. Schlosser, who sailed all the way to Georgia and defeated 14 other contestants. America has won the trophy twice in succession, and should we be so fortunate as to win it again, the trophy will remain permanently in this country.

NAT'L BALLOON RACE

PITTSBURGH, PA., MAY 30

THE Army will be represented at the annual National Elimination Balloon Race at Bettis Field, Pittsburgh, Pa., May 30, by three teams: 1. Capt. William E. Kepner, pilot; 2nd Lieut. William O. Eareckson, aide. 2. Capt. Edmund W. Hill, pilot; 2nd Lieut. Henry G. Fisher, aide. 3. First Lieut. Paul Evert, pilot; 2nd Lieut. U. G. Ent, aide.

The officers of the first two teams are stationed at Scott Field, Belleville, Ill., and the third team at Langley Field, Va.

The Navy has entered two free balloons from the Naval Air Station, Lakehurst, N. J., each having a crew of two men, as follows: Crew No. 1—Lieut. T. G. W. Settle, U.S.N., pilot, Chief Boatswain's Mate, G. W. Steelman, U.S.N., Knoxville, Tenn.

Crew No. 2—Lieut. J. H. Stevens, U.S.N., Pilot, Vandalia, Mich.; Lieut. (jg) George F. Watson, U.S.N., Shellman, Ga.

Civilian entrees are: E. J. Hill and A. G. Schlosser; Clarence Palmer and J. E. Mell; Ward T. Van Orman and W. W. Morton; George Hineman and E. F. Johnson; H. E. Honeywell and Arthur C. Hoskins; William J. Bennett and Walter Chambers; Carl K. Wollam and J. F. Cooper.

The winner of the elimination race will represent the United States in the international balloon race for the Gordon Bennett trophy, which will be held at Detroit, Michigan, on June 30.

4th NATIONAL AIR TOUR

AT ten o'clock, on the morning of June 30th, the starter will drop the flag and a great air fleet will roar upward, bound for Indianapolis, the first stop on the 6,000-mile tour. The tourists will visit St. Louis; Tulsa; Fort Worth; San Antonio; El Paso; San Diego; Los Angeles; San Francisco; Oakland; Portland, Oregon; Spokane; Great Falls, Montana; Minot, North Dakota; St. Paul; Wausau, Wisconsin; Chicago; Battle Creek, and then return to Detroit, the winner being awarded the Edsel B. Ford Trophy. Every type of plane will be represented, from the big commercial transports to the small sport models.

The purpose of the National Air Tour is to demonstrate the reliability and practicability of commercial aviation under everyday travel conditions and to promote public acceptance of flying in general.

The 1926 Tour was won by Walter Beech. In 1927 Eddie Stinson was the victor. The 1928 Tour will see the very latest and finest planes flying in quest of the trophy.

Rules for the Fourth Annual Air Tour, June 30 to July 28

THE Edsel B. Ford Reliability Trophy, donated by Edsel B. Ford, shall be competed for annually by commercial airplane manufacturers.

This contest shall be in the nature of a cross-country tour from city to city and shall be conducted over a course and under such rules as may be prescribed from time to time by the Contest Committee of the National Aeronautic Association.

The Trophy shall be awarded each year, to the entrant of the winning airplane, who shall be entitled to possession of the Trophy until one month prior to the next succeeding contest at which time he shall deliver the Trophy to the Contest Committee of the National Aeronautic Association. A suitable bond for the proper care and return of this Trophy shall be required by the National Aeronautic Association from each person or organization into whose possession the Trophy may be delivered.

The Trophy shall become the permanent property of any manufacturer who shall win it on three consecutive occasions.

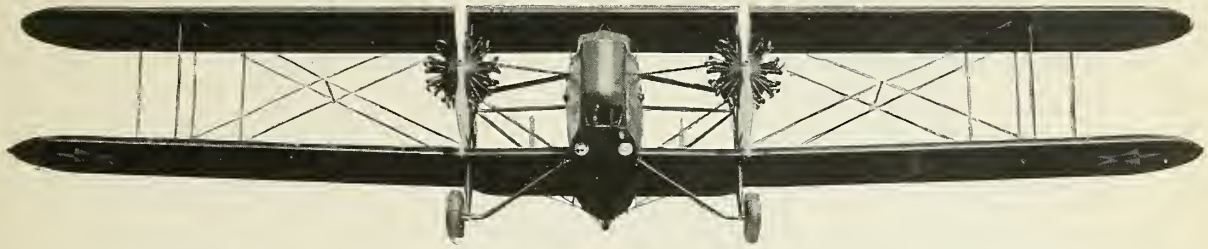
In order to stimulate entries among civilian constructors and civilian pilots, government-owned planes will not compete in this Tour.

Rules and Conditions for 1928:

Each airplane entered in the National Air Tour shall be capable of a speed in excess of eighty miles per hour with a full contest load, and shall be required to demonstrate this speed before being allowed to compete in the Tour.

No airplane shall be eligible to compete in the National Air Tour of 1928 unless an Approved Type Certificate has been issued by the Department of Commerce of the United States for that particular type of airplane. An exception to this may be granted to entrants who have not yet received Approved Type Certificates from such Department, provided they have filed applications for such certificates with the Department together with the supporting data required by the Department, on or before June 15, 1928, thus enabling the Department to determine by a suitable check thereof, together with an inspection and flight test

KEYSTONE WINS AGAIN!



THE "PANTHER"

Winner of the recent competition to determine the best tactical Light Bombardment equipment for the Army Air Corps.

PERFORMANCE
MANEUVERABILITY
SIMPLICITY
DEPENDABILITY
LOW MAINTENANCE

were the Outstanding Features that won the approval of a carefully selected Board, composed of well known Air Corps Bombardment Experts, chosen to decide on new equipment.

The PANTHER carries two 1100-pound bombs and is powered by twin radial air-cooled engines of 525 H.P. each.

The Army's choice of the PANTHER accentuates KEYSTONE'S standing as builders of large airplanes.

THE PATHFINDER Commercial Transport – accommodating 12 persons – meets the same structural and performance specifications as the Air Corps Bomber.

Full Particulars on Request

KEYSTONE AIRCRAFT CORP.

Bristol Pennsylvania

of the airplane involved, whether it is in order to issue an experimental license for the purpose of the Tour. The acceptance of such entries shall be optional with the Tour management.

Contest Loads:

The contest load is the load which the entrant desires to put in the 'plane providing the following load conditions exist to the satisfaction of the Contest Committee:

(a)—The contest load shall not exceed the maximum useful load permitted by the Department of Commerce under the approved type certificate awarded the ship.

(b)—This contest load may consist of passengers, inert and useless ballast, or both, and must include the weight of the pilot and the weight of gasoline with the tanks full. Tools, spare parts, cockpit covers may be included in the contest load when properly sealed and marked.

(c)—For the purpose of the stick, unstick and maximum speed tests, the contest load will consist of passengers and ballast, or ballast in addition to full tanks of gasoline and in sufficient quantity to bring the contest load of the ship up to the maximum useful load permitted by the Department of Commerce for each ship. After the stick, unstick and maximum speed tests have been completed the entrant may reduce his useful load to 75 per cent of the maximum permitted by the Department of Commerce and still be given credit for 100 per cent in the formula.

Planes will be required to leave each control with full gasoline tanks. The same will apply to oil tanks except that a margin of 25 per cent of the capacity of oil tanks will be allowed for expansion. Upon arrival at each control, each entrant will be required to account for a full 75 per cent of the maximum useful load permitted by the Department of Commerce except for the difference in gasoline and oil consumed during the flight.

(d)—No contestant will be allowed to carry passengers in excess of the original designed seating arrangements of the plane as referred to in sections 24-H and 62-I of the Air Commerce Regulations.

Method of Scoring:

(a)—The Contest Committee will require each plane to qualify by flying four times over a measured course of approximately one mile, twice in each direction, to establish maximum speed to be used in the formula.

(b)—After the beginning of any of the tests no change will be permitted in the propeller setting of a ship until after all tests have been completed.

(c)—In order to discourage racing and its attendant dangers, the maximum speed will be used in the formula, unless the average speed for an individual lap shall fall below 80 per cent of the maximum credited speed. In such an event the actual miles per hour will be used in the formula to determine the figure of merit.

Formula:

$$\frac{\text{Max. D. of C. useful load} \times \text{max. speed}}{\text{stick} + \text{unstick}} \times \frac{50}{\text{disp.}} = \text{merit}$$

Example:

Plane has a useful load rating of 1200 pounds and shows a maximum speed of 125 miles per hour. 75 per cent of 1200 pounds is 900 pounds. 80 per cent of 125 miles per hour is 100 miles per hour. Thus, if the ship carries 900 pounds and the lap speed is 100 miles per hour or better, the formula would read:

$$\frac{1200 \times 125}{\text{stick} + \text{unstick}} \times \frac{50}{\text{displacement}} = \text{points}$$

If, however, a plane shall arrive at a control with less than seventy-five (75) per cent of the maximum useful load permitted by the Department of Commerce, exclusive of gasoline and oil consumed, or if the actual speed for a lap should fall below 80 per cent of the maximum credited speed, the formula would read thus:

$$\frac{\text{actual load} \times \text{actual speed}}{\text{stick} + \text{unstick}} \times \frac{50}{\text{disp.}} = \text{points}$$

The winner of the 1928 National Air Tour shall be declared to be the contestant who has the highest number of points at the completion of the Tour. For the purpose of determining this, the points of each lap of the Tour shall be figured separately and the totals added to obtain the aggregate. In no case shall a contestant be declared the winner of the Tour unless he shall have completed every leg thereof and arrived at the point of starting by sundown of the last day.

In the event of a tie under the previous formula, the winner at the end of the Tour shall be declared to be the contestant who has the highest number of points under the following efficiency formula:

$$\frac{\text{contest load} \times \text{speed}}{\text{engine displacement}} = \text{points}$$

Second position shall be awarded to the contestant having the second highest number of points under the formula used for determining the winner and the third shall have the third highest number of points and so on down until all surviving contestants are accounted for.

Entrants, Contestants and Entries:

For the purpose of these rules the Entrants shall be defined as the manufacturer or maker of the plane. The Contestant shall be defined as the Pilot named by the Entrant to fly the ship and direct its activities. An Entry shall be defined as a combination of ship and pilot.

Subject to the conditions of these rules any manufacturer shall be eligible to compete but no manufacturer shall be permitted to enter more than three planes in the Tour. Any plane manufactured by an entrant, up to the limit of entries permitted, shall be eligible to compete whether or not at the time of entry it is the property of a manufacturer or of an individual, except that it may not be the property of the United States Government or of any other government.

An entrant desiring to offer a plane for competition shall fill out the Official Entry Blank in detail and forward to the Tour Manager accompanied by a check drawn to "National Air Tour," in the amount of $100.00. In the event that the Entrant shall actually start the contest and shall cross the starting line at the time indicated or within two hours thereafter the entry fee so deposited shall be returned. In the event of failure to so start, however, said entry fee shall be forfeited and shall become the property of the "National Air Tour."

Midnight of Saturday, June 16th, 1928, shall be designated as the closing date for entries and any entries not received by the management before that time or which shall not bear postmark prior to that time, shall not be received or accepted, except as hereinafter provided. Under no circumstances will post entries be accepted nor will any application for entry be considered unless it shall have been presented to the Tour Manager not later than 9 o'clock a. m., on Wednesday, June 27th, and, under those circumstances, will be considered as a delayed entry. Delayed entries may be submitted to the Tour Manager after the official closing date, but in that event the entrant shall forfeit all claims to the entry fee of $100.00 and shall, in addition thereto, be required to get the written consent from all entrants whose applications have been filed prior to the official closing date.

Any entrant may at any time prior to the start of the Contest or during the Contest substitute a pilot for the one named in the entry blank providing such substituted pilot shall have complied with the regulations of the Department of Commerce and such other regulations as may hereinafter appear and also provided the consent of the referee for such substitution is obtained. A contestant may not substitute another ship for the one named in the entry blank unless it can be shown to the satisfaction of the referee that the ship named has been damaged in such a manner and in such a way as to make it unairworthy. In no event may a second ship be substituted for the one named in the entry blank after the start of the Contest from Dearborn.

Official Starting Time:

Saturday, June 30, 1928, shall be the starting date and the first ship shall take off at ten o'clock in the morning of that day.

Rotation of Ships After Starting:

After the official start at Dearborn the sequence of starting shall be determined inversely by the time of arrival at the last night control station. In this manner the last plane to be checked in at a night control station shall be the first to depart on the next leg of the Tour. The second plane out shall be the one which arrived next to the last and in that manner until all planes have taken off with the plane which shall have arrived first at the said night control station being the last to depart. Where noon control stations are established the order of departure from these shall be in the order of arrival, first in, first out. The above method of start shall apply to all control stations except in the last control station out of Detroit on the last day of the Tour. On this occasion the first plane to depart from the control station shall be the plane which shall have the highest total number of points at the close of the previous day. The second ship to take off shall be the one which shall have the second highest number of points

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AIRPLANE Hangars must be laid out in clear spans so that the entire floor space is unobstructed, allowing maximum freedom in handling ships. Doors of unusual width must be provided in one or both ends of the building to permit easy entrance and egress of the planes. The entire building should be non-combustile because of the unusual fire risk. Furthermore, the impossibility of foreseeing future needs, makes it advisable to select buildings with a high salvage value; buildings that may be taken down and reerected at a new site or enlarged to take care of additional needs.

Truscon Standardized Steel Hangars, furnished from stock, are designed to meet all of these conditions.

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TRUSCON STEEL COMPANY, YOUNGSTOWN, OHIO
MANUFACTURERS AND ENGINEERS





COMPLETE BUILDINGS FOR ALL AIRPORT REQUIREMENTS

and so on until each ship is accounted for.

Fifteen minutes before the official starting time the official starter shall raise a red flag which shall be the signal for all pilots to start their motors and, where practical, taxi their ships to the proper positions for the official start. Taxiing about the field other than for the purpose of getting into proper position in the starting line shall not be permitted.

One minute before the starting time of the first ship, the official starter shall raise a white flag which shall be dropped at the proper time to indicate get-away of the first ship. Other contestants will be given a starting signal at one-minute intervals thereafter and this shall be designated in each case by the dropping of the white flag.

Should a contestant be unable to start at the time the signal is given he shall be permitted to depart at any time thereafter but the departing time shall be figured from the time of the signal and not from the time of actual departure. In this event he shall not interfere with the starting of any other ship but shall await the starter's signal that no conflict may result.

Elapsed Time:

Each contestant shall be scored on a basis of elapsed time which shall be taken from the starting signal at the previous control and completed when the contestant shall cross the finish line at the next control in full flight. The actual landing time at each control shall not be considered as it may be determined by each pilot for himself and must be so timed as to prevent accidents as a result thereof.

Each pilot will carry an official log which will be provided by the Tour officials. Prior to the start from Dearborn, this log must be filled out and contain all information regarding the entry together with a record of passengers and weight of ballast and baggage carried. At each control station this log must be turned over to the checker who will enter thereon the record of his checkup and note thereon any discrepancy he may discover. Immediately, thereafter, the pilot shall turn the log over to the official scorer who will retain it until after the day's score is completed. It will then be returned to the pilot who must present it to his cheker before departure on the following day. The checker will then either O. K. the log or make a notation of any discrepancies he may have discovered at this time and it shall be the duty of the pilot to see that this is done. In the event of failure on the part of the pilot to obtain his official O. K. or notation, the pilot will at the next control, at the discretion of the referee, be penalized not less than fifty points but in no case in excess of the total number of points for the leg on which such penalty occurred.

Deferred Start:

The start of the first and subsequent planes from any of the several controls may be deferred only at the discretion of the referee and only in the event of inclement weather or other questionable conditions. If it appears that there is any reason for delaying the start, the referee shall consult with the pilots and if no protest is received, the start shall not be deferred. The starting time for the first plane from each control shall be in accord with the 1928 Tour Schedule as laid down by the officials in charge.

Eligibility of Pilots:

Any recognized pilot shall be eligible to compete in the 1928 National Air Tour, provided he can show evidence of having complied with the requirements of the Aeronautical Division of the United States Department of Commerce and shall in addition thereto, hold an F. A. I. certificate and the annual sporting license issued by the Contest Committee of the National Aeronautic Association. Any pilot may, however, be relieved from duty or suspended by an official representative of the United States Department of Commerce or by the referee for physical inability. Such suspension by the referee, however, shall not be made without consultation with a reputable physician and upon the advice of such physician.

Any pilot may be required to undergo a physical examination within 48 hours prior to the start of the Contest or at any time thereafter at the discretion of the referee. No pilot shall be permitted to compete who is not, in the opinion of the examining physician, in physical condition to do so without injury to himself or other contestants.

Preparation and Tests Prior to Start:

All entries, consisting of planes and pilots, shall be required to be at the Ford Airport at Dearborn, Michigan, not later than nine o'clock a. m., on Wednesday, June 27th. This is to permit checkers to weigh up ships and complete the work of loading and sealing ballast, tools and spare parts in place in preparation for the stick and unstick tests which will be held on Thursday, June 28th. No flying will be permitted on June 27th which will conflict with the weighing or loading of ships.

Beginning at nine o'clock on Thursday, June 28th, the stick and unstick tests will be held. At this hour, each plane will line up in the order of entry, complete with the full contest load. During the stick and unstick tests and the maximum speed tests, all fuel tanks must be filled to capacity and all oil tanks must be filled excepting for reserve air space which may not exceed twenty-five per cent of the total capacity of the tanks. In addition to fuel and oil, each plane in the stick, unstick and maximum speed tests must carry the full useful load permitted by the Department of Commerce of the United States as specified in the approved type certificate awarded the ship. In addition to the gasoline and oil, this load may, for the purposes of these tests, be in the form of passengers or ballast as the pilot may elect.

After the stick, unstick and maximum speed tests have been completed, a contestant will be allowed to reduce his useful load to seventy-five per cent of the maximum permitted by the Department of Commerce and specified in the approved type certificate awarded the ship. No contestant shall be allowed to carry gasoline except in the tanks regularly provided for such purpose and which shall have been used for such purpose during the stick, unstick and maximum speed tests.

At nine o'clock on Thursday, June 28th, the first plane shall take off from a standing start for the unstick tests. The planes will be divided in groups of three each for these tests so that at no time will there be more than three ships in the air at the same time. Three timers will check the number of seconds required to unstick the plane from its standing start until the wheels are off for the last time. In the event of a discrepancy between the timers, the average time shall be taken as the official time.

The second and third plane of each group will take off at signals in the unstick tests and each pilot will circle the field in the direction indicated to him the morning of the start and each will watch for his number to be displayed on the roof of the small hangar as an indication that he has the right of way to land for his stick test.

Immediately upon receiving signal to land for the stick test, the pilot will comply. The timers will then check the number of seconds required to bring the plane to a dead stop after the wheels touch the ground for the first time.

Multi-Motored Ships

An entrant of a multi-motored ship will be allowed a lower cubic inch displacement figure than that which actually exists and that used in the formula providing he can demonstrate to the satisfaction of the Contest Committee that his plane is capable of performing as follows:

(a)—It will be required that the pilot of a three-motored ship climb from 1,000 foot altitude to 2,000 foot altitude as indicated on a calibrated altimeter carried by the Contest Committee observer as follows: With the center engine dead, he shall climb from 1,000 feet to 1,400 feet, with the right engine dead he shall climb from 1,400 to 1,700 feet and with the left engine dead he shall climb from 1,700 feet to 2,000 foot level. If he shall accomplish this to the satisfaction of the Contest Committee observer, he will then be allowed a cubic displacement figure of two-thirds of the actual cubic displacement of all motors.

(b)—Where a twin-motored ship is employed, the pilot must climb from 1,000 feet to 1,300 feet with one motor dead and from 1,300 to 1,600 feet with the other motor dead. If successful, he will be allowed a cubic displacement figure of one-half of the actual cubic displacement of the two motors. In the event of failure to do this in either case to the satisfaction of the Contest Committee Observer, the total cubic inch displacement of all engines will be taken as the displacement figure in the formula.

Trophies and Prizes:

In addition to the Trophy, there shall also be the following cash awards:

To the plane making the best showing and obtaining the highest aggregate number of points under these rules, $2,500.

To the plane obtaining the second highest number of points, $2,000; third, $1,750; fourth, $1,500; fifth, $1,250; sixth, $1,000; seventh, $750; eighth, $550; ninth, $400; tenth, $300.

Each competing plane finishing the Tour on the final day and not placing among the first ten will be given a bonus of $200.



Equipment for the Modern Airport

When the science of aviation was considerably younger than it is today, IDECO engineers were already at work designing airway equipment.

IDECO hangars provide large, clear hangar space unobstructed by columns. They are strong, attractive, weather tight, fire and rust proof structures combining long life with low initial cost and economical erection.

The use of the hot dip galvanized steel frames makes IDECO hangars and standard buildings particularly adaptable for use in housing seaplanes and flying boats. The corrosive action of salt air and salt water will not cause them to rust away or require constant painting.

In addition to hangars, we are prepared to furnish all of the other buildings and towers necessary for airports and airways.

Write to Aviation Department.

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The DeHavilland "Moth" soon to be built in the United States

NEW YORK AIR NEWS

THREE powerful Sperry airport floodlights completely illuminated the Barren Island airport site, New York City's airport, during May. The demonstration was made by The Sperry Gyroscope Company of Brooklyn, N. Y., and was witnessed by Mr. Keller, chief engineer of the Dock Department and Mr. Lansing of the same department.

HARRY F. GUGGENHEIM, president of the Daniel Guggenheim Fund for the Promotion of Aeronautics was awarded the American Arbitration Association's gold medal for distinguished service in the promotion of commercial peace through his excellent work in the field of aviation.

A COURSE in aeronautics designed to indicate the methods of aeronautical instruction best adapted for the pupils of elementary and secondary schools throughout the country will be given for the first time this summer by the Summer School of New York University through a special arrangement with the Daniel Guggenheim Fund for the Promotion of Aeronautics.

MAYORS of the cities of New York State will meet at Troy, June 5, 6, and 7, to discuss air transportation and other problems relative to air developments. Secretaries Davison and MacCracken and other aviation experts will be present.

THE State of New York has passed a regulatory act requiring federal, pilot and aircraft licenses as a requisite for intrastate flying. The act will take effect July 1. Violations will be punishable by a fine of not more than $100, or by imprisonment for not more than 90 days, or both.

LEE HURDMAN HARRIS, of Brightwaters, L. I., is entering the airport engineering field.

Mr. Harris graduated from the Curtiss Flying School, at Hammondsport, N. Y., in 1915. He soon afterwards organized and commanded the first Militia Flying Unit in this country. He also layed out and engineered the construction of the Naval Militia Air Station at Bay Shore, L. I., which later developed into the Naval Air Station. In addition Mr. Harris is a professional civil engineer of 16 years general engineering and building construction experience.

THE students of the Daniel Guggenheim School of Aeronautics of the College of Engineering of New York University have organized the N. Y. U. Flying Club. The club, whose size has been limited to forty student members and which intends to use the flying field near the campus at University Heights, is making plans to raise $5,000 for the purchase of a plane.

MOTH AIRCRAFT CORP.

FORMATION of the Moth Aircraft Corporation, for the quantity production and sale in this country under exclusive license rights of the De Havilland "Moth" light airplane, has just been announced and work is scheduled to begin as soon as a factory site has been selected. It is planned to have the first American-built "Moth" ready for the air by the latter part of August. The new concern has obtained a full charter from the De Havilland Aircraft Co., Ltd., of England, and was incorporated recently in Delaware at a capital stock of $500,000.

As produced in the United States the "Moth" will embody a number of features not heretofore seen on the few planes of this type that have come to America. These include a new type split axle landing gear having a wider tread and consequently greater stability on the ground, a steerable tail skid for better maneuverability in taxiing and an adjustable stabilizer by which the ship can be "trimmed" in flight for varying load conditions until it will fly "hands off".

In addition the American-built "Moth" will be equipped solely with the new De Havilland "Gypsy" 100 horsepower four cylinder in line air-cooled engine.

Although the manufacturing program of the Moth Aircraft Corporation contemplates the production in this country of both the "Moth" plane and the "Gypsy" engine with which it is to be equipped, a number of engines will be imported at first to keep things going until manufacture is well under way.

The American company is headed by Earl L. House, as business manager, J. Edwin Morrow, general factory manager in charge of production, and Kenneth R. Unger, who will be at the head of the sales and sales promotion department. Others on the Board of Directors include Horace H. Work, chairman, and Joseph Smith. Brodie G. Higley, is general counsel for the corporation.

SEAPLANE AND MOTORBOAT RACE AT RYE, N. Y.

A COMBINED seaplane and motorboat race meet will take place July 11 and 12, at Playland, the new $5,000,000 County Amusement Park, at Rye, N. Y., under the auspices of Playland, Westchester County Park System.

The motorboat races will be conducted by the Colonial Yacht Club of New York and the New York Outboard Motor Club Association, with the cooperation of the famous Regatta Circuit Riders Club, composed of motorboat enthusiasts from all over the United States. The racing will be under the sanction of the National Aeronautic Association and it is expected that the well known aviators' association, the Quiet Birdmen, will take prominent part in the contests. Special events are being arranged, including various kinds of parachute jumps and races between fast boats and seaplanes.

Of the motorboat committee, George W. Sutton, jr., is chairman. Fitzwilliam Dalrymple is general chairman of the aviation activities. Serving with him on the aviation committee will be Admiral Louis M. Josephthal as honorary chairman, Frank Tichenor, Casey Jones, G. Summer Ireland, Ruth Nichols, Lieut. John W. Iseman, Lieut.-Commander Kenneth Gundelach and Lieut. George Noville.

Among the entries received to date for the aviation contests are: Jack Tweed, former naval aviator and now owner of the New Haven Air Terminal, and Joe Kane of the City Island Airways have entered Seagull planes in the race of this class. Harry Rogers of Rogers Airways, Port Washington, has also entered several Seagulls. All Seagulls for this race will be powered with 150 h.p. Curtiss C-6 engines. G. Seymour Ireland has entered his Neptune amphibian, powered with the Wright Whirlwind engine. Atlantic Airways has entered an Aeromarine flying boat powered with an Hispano-Suiza 180 h.p. engine and an Alexander Eaglerock seaplane powered with a new 175 h.p. air-cooled engine.

The complete program of aerial and nautical events, 36 in all, will be announced in the July issue.

ITHACA AIR NEWS

SINCE its organization last fall the Cornell Flying Club has helped to arouse considerable interest in aviation in the university and in Ithaca. The attempt of the club to cause the institution of an aerodynamics course in the Sibley College of Engineering at Cornell University fell through because of the fact that the faculty was temporarily short-handed, but the outlook is bright for such a course next fall. Attendance at Professor Frederick Bedell's Elementary Aerodynamics course in the Department of Physics and Professor G. B. Upton's Automotive Engines course in the School of Mechanical Engineering has been greater than in previous years.

A number of well-qualified speakers on aviation topics spoke at the winter meetings of the club.

"How To Use AVIATION INSURANCE PROTECTION Economically and Advantageously" . . . .

. . . . Is the title of our new brochure. Ask us for a copy. It explains also our free advisory service founded on 20 consecutive years' practical experience in aviation and supported by our corps of highly qualified aeronautical engineers and our staff of executives each one of broad practical experience in flying besides long training in insurance. Our long experience, knowledge and organization are at your service to assist in minimizing hazards with consequent reduction of operational costs and insurance rates, thus helping to improve, broaden and stabilize both your interests and our interests as Underwriters. Cooperation is the key to that result and is achieving remarkable improvements. Our success is founded on service and sympathetic cooperation fortified by long experience.

Insurance Protection Available
aggregates over
$750,000 per aircraft

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Lowest Rates
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Policies have been issued over a long period of years and, among others, in favor of Federal and State Governments, Boeing Air Transport, Inc., Colonial Air Transport, Inc., National Air Transport, Inc., Western Air Express, Inc., Robertson Aircraft Corp., Colorado Airways, Inc., Northwest Airways, Walter T. Varney, Inc., Southern Dusting Co., Inc., Philadelphia Rapid Transit, Stout Air Service, Inc., Boston Airport Corp., American Railway Express, Ford Motor Company, Fairchild Aerial Surveys, Fairchild Flying Corp., Pacific Marine Airways, Pitcairn Aviation, Inc., Western Canada Airways, Andian National Corp., United Cigar Stores Co., Royal Typewriter Co., Hamilton Maxwell, Inc., Pulitzer and other race meetings, Universal Motion Picture Corp., Fox Film Corp., The Daniel Guggenheim Fund for the Promotion of Aeronautics, Inc., and many others including Col. Charles A. Lindbergh and other leaders in aviation.

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B & B SERVICE

20 YEARS OF PRACTICAL EXPERIENCE IN AVIATION

BALTIMORE AIR NEWS

By Edward Johns

PRELIMINARY work on the Baltimore airport was started this month when the Board of Estimate transferred $4,000 to the Harbor Engineer, Elmer E. Hammond, to drive test piles and make borings for foundation work in the section to be filled. The entire area was also staked off.

Lieut.-Col. Charles R. Pettis, United States District Engineer, has forwarded his recommendation on the proposed extension of the bulkhead line to allow greater area for the airport and it now is before the War Department. Favorable action is expected.

A PROPOSAL that the city give $15,000 for a Baltimore-to-Rome flight was turned down after study by a committee appointed by the Association of Commerce. It was decided that such a flight, in view of the fact that the Atlantic has been crossed several times, would serve no better purpose than to create publicity.

TWO National Guard officers, Capts. Charles A. Masson and George Cobb, were chosen to take part in the machine gun and bombing matches being held at Langley Field from May 25 to June 10.

EVERYTHING is set for the eighth annual aircraft exhibition at Logan Field, May 30th, which promises to be the top-notch affair of its kind ever held here. The Marines are sending 10 Hawks; the Navy, 4 Hawks, 2 Corsairs, 4 OO-1s and a Ford transport; the Army, several Hawks and Falcons and bombing craft, while the New York, Connecticut, Massachusetts and Pennsylvania National Guard are each scheduled to send a formation. There are twenty planes on the field here, including the 3 Falcons, 3 PT-1s, 2 TWs and the rebuilt air mail plane of the guardsmen and the instructor, and the 6 Travel Airs and 1 Fairchild of the Chesapeake Aircraft Company. The Chesapeake Aircraft received three more Travel Airs late last month.

GEORGIA AIR NEWS

By Al Major

MAY 1st marked the opening of the New York-New Orleans air mail line. Atlanta celebrated the occasion with appropriate ceremonies at Candler Field. The two mail planes from New Orleans arrived a little late because of the ceremonies in Mobile and Birmingham, one a Whirlwind-Travel Air, piloted by W. N. Dewald and a Fokker Universal, piloted by Vivian Jones. Gene Brown piloted the first Pitcairn Mailwing to leave Atlanta for New York.

After the ceremonies a banquet was given at the Capital City Club by the Air Mail Committee, of which William B. Hartsfield is chairman, to two hundred of Atlanta's leading citizens and our visitors.

Sidney Malloy had the pleasure of bringing the first mail to Atlanta from New York and arrived 17 minutes ahead of schedule. Pilot John Kytle made the round trip from Atlanta to Richmond, Va., the control station between Atlanta and New York.

SURVEYING of the Atlanta-Miami air mail route has been started by officials of the U. S. Department of Commerce headed by Alvin W. Smith. Three principal cities on the route, Macon, Waycross and Jacksonville, already have adequately equipped airports.

VICTOR F. GRIMA, traffic manager of the St. Tammany and Gulf Coast Airways, Inc., and J. G. Ray, general operations manager of Pitcairn Aviation, Inc. were in Atlanta recently. Mr. Grima announced that the Black & White Cab Company would furnish taxicab service to Candler Field to patrons of the passenger airline.

GEORGE KREIGHER, a well known old-timer, recently landed at Candler Field in a Fairchild monoplane, belonging to Brock & Weymouth, Inc., of Philadelphia. He was accompanied by John Turner and will be in Atlanta for about a month doing aerial photography work.

THE Dixie & Northern Air line recently announced that they would soon commence operations between Detroit and Miami.

BINGHAMTON NEWS

By John B. G. Babcock

WITH city officials of Binghamton planning for airport development, and with four locally owned planes, several pilots and mechanics, as well as a good emergency landing field, this community is taking a lively interest in the possibilities of aeronautical development. The local planes are a Waco biplane, owned by Richard L. Bennett, who has conducted a flying school and maintained an emergency landing field here for the last seven years; a Cessna cabin monoplane, owned by the Aero Sales Co. of Binghamton; a Curtiss Oriole biplane, owned by Gunne Lowkrantz; and another Curtiss, owned by Richard Wells.

THE Binghamton Aero Club has voted to disband, effective June 1. The club, which had 260 members, was formed a year ago for the purpose of arousing Binghamton to the need for an adequate airport.

Mayor Norman A. Boyd has assured the public that the city will provide an adequate airport. A municipal council committee, with the mayor and city engineer, has been investigating prospective airport sites here for several months.

THE Endicott Aero Club, which maintains a flying field and temporary hangar at West Endicott, 10 miles west of Binghamton, is planning to hold an air meet on its field early in June.

OWEGO AIR TRANSPORTATION CO., which was formed recently, has obtained a 10-year lease on land just west of the Owego creek, in the westerly part of the village of Owego, 20 miles west of Binghamton. The field was opened for use May 9, when the company received its first International plane. This company has obtained the New York state agency for distribution of the International Aircraft Corporation's planes.

Leon P. Brink, who flew the plane in from Cincinnati, will conduct a flying school at the field. Leonard D. Dickinson, who has conducted a motorbus service for several years, is vice president of the company which has leased the field, and is said to be the chief promoter of the concern.

BUFFALO AIR NEWS

By B. C. Webster

WORK in expanding the local plant of the Curtiss Aeroplane and Motor Co., started with the announcement of the proposed rail and air transcontinental lines. More than $100,000 worth of equipment, to be used in increasing production, is being installed in the Kail street plant. According to C. Roy Keyes, vice president of the company, another plant will be constructed. The experimental planes for the transcontinental lines are now being designed and the first units will be completed early in 1929, he said. More than 50 additional men will be employed.

HEADQUARTERS for the Cleveland-Albany air mail line which starts operation June 1, will be located in Buffalo, according to W. T. Lyman, manager of the Colonial Airways, Inc., which has the contract for the route. Eight planes—four Fairchilds, two Bellancas and two Pitcairns, each equipped with a Wright Whirlwind motor—will be used. Passengers, mail and express will be carried.

ALONZO M. VINCENT, in charge of Buffalo air mail for the government and Ben Dahlkem, designer of the new air mail envelope adopted recently by the government, were local representatives at the state-wide conference for the promotion of air mail, in Elmira.

CARLTON W. GRIFFIN, formerly employed by the Athletic Club, has been appointed traffic representative of the Colonial Airways, Inc.

TWO new organizations were formed within the last month to further aviation. One is the class at the Elm Vocational school. Headed by Michael Steffan, the club has purchased a Waco plane from Charles Dallas and will employ an instructor to teach its members flying. The other club is known as the Buffalo Civilian Air Service. Members will be taught how to fly.

A HUGE parachute, capable of lowering ten or twelve passengers from an airplane, or lowering a small plane, passed its first army test, according to George Waite, president of the Irving Air Chute Co. of Buffalo. He has been working to perfect the chute for six years. It is made similar to regular flier's chutes, which are 24 feet in diameter. The big chute is 80 feet across. The final test will be made in Dayton some time in June.



Down the Years with Aviation

EVER since America got into the big scrap in 1917, HYVIS Aero Oil has dependably lubricated aircraft engines.

HYVIS was largely instrumental in proving that a pure mineral oil could carry on in the place of castor oil and do a *better job.*

The introduction of the radial air-cooled motor revolutionized aero engine design and demanded new performance from aero oil. HYVIS met this demand easily and continued to afford a wide margin of protection.

Flying, today, is not a question of going up in the air to shoot and be shot at, but the importance of safe lubrication is still and always will be a vital factor.

Just as HYVIS helped the fighting planes ten years ago, it is now helping commercial planes to do a still bigger job—*fly longer at lower cost.*

HYVIS is a 100% Pennsylvania oil refined to an unusual degree of *purity.* Its efficiency is a result of its slower reaction (thinning-out) to heat and ability to flow freely at low temperatures. With HYVIS in your motor, constant pressure and safe lubrication are assured.

If HYVIS cannot be obtained at your flying field, write for name of distributor in your town.

FRED G. CLARK, Inc., Cleveland. Established 1882. Chicago, Minneapolis, Los Angeles. Refineries, Warren, Pa. Distributors at all Principal Points.



Well Away!

NEW ENGLAND NEWS

By George W. Hamblin

THE trimotored Fokker that Commander Byrd hopes to use as a load carrying ship on his South Pole Expedition, has been fitted to pontoons, and with Wilmer Stultz at the controls, was test-hopped. The flight was a success, and a routine of tests were immediately run. The plane has been named "Friendship", and causes no little amount of comment riding out in the harbor.

EDWARD T. O'TOOLE, head of the Associated Aircraft of Boston, has opened a resident flying school at Martha's Vineyard to operate in the same manner as a summer camp for boys. There are facilities for golf courses, riding, fresh and salt water swimming, shooting ranges, and everything that a boy could ask for. When the summer flying camp is well established, O'Toole plans to add courses in all academic subjects that may be of help to the students in passing their college-entrance exams.

BERT KOGLE, transport pilot of the American Eagle Aircraft Company, flew a new Eagle in from the factory for the Bay State Flying Service, and the ship was promptly turned over to Herb Ralston, director of the Granite State Flying Service, with a flying field at Manchester, New Hampshire.

SKYWAYS, INC., has taken delivery of a new Challenger. Charlie Emerson has been added to the staff as a pilot and student instructor. George Barry, flight-ticket seller de luxe, with his helper, Danny Dugan, is still hopping em "three thousand feet at one hundred miles an hour."

Andrew Ivanoff, treasurer of Skyways, Inc., informs us that his company has taken on dealerships of the Monocoupe and Stearman airplanes.

A FLASH from B. F. Billings just before we went to press states that the Airport Corp. will have a Ford trimotor before many weeks are out. This ship will be used for hops around the famous places in the vicinity of Boston, such as Lexington and Concord, etc.

THE "Kitty Hawk", the first commercial airplane built in New England since the war, was test hopped recently by Allen Bourdon at Pothier's Airport, Buttonwoods, R. I. The ship is a three-place open cockpit job, powered with a 100 horsepower Ryan-Siemens motor. Bourdon, with his brother Ralph Bourdon, Hank Kurt and Harold T. Dennison, flew the ship up to Boston where local pilots inspected it and where Asst.-Sec. Bill MacCracken looked it over. Bob O'Brien, state inspector of aircraft, flew the ship, and everybody united in pronouncing it a darn good airplane.

A NEW airport has made its appearance, this time it is the Hyannis Airport, located three-quarters of a mile north of Hyannis, between Barnstable, West Yarmouth, and the Mary Dunn roads. The field is under the direction of Robert Ayling, young Boston man, who took flying instruction from the Airport Corp. two years ago, and who was with the Dennison Airport Corp. until just recently.

WITH the delivery of a new-production Fairchild monoplane, activity at the Dennison Airport, Atlantic, Mass., sprang into its regular stride. The corporation is Waco and Fairchild dealer for eastern Massachusetts and Rhode Island.

The runways at Dennison Airport will be enlarged to a minimum of 2,000 feet and night-flying equipment will be installed. These improvements will make the Dennison Airport the best flying field in the vicinity of Boston.

The corporation is composed of Harold T. Dennison, president; Major C. H. Wooley, commander of the 101st Observation Squadron, M.N.G., vice president; and William Bradford, former mayor of Quincy, treasurer. The pilots employed are Hank Kurt, a Boston Tech man, chief pilot, Alan Bourdon and Al Sherman.

Lowell Airport Dedication

LOWELL AIRPORT at Lowell, Mass. will be dedicated and opened on June 21, 22 and 23, under the management of American Airports Corporation.

The Air Meet and Exposition Department of the American Airports Corp., the manager of which is Albert R. Rogers, in cooperation with Joseph A. Legare, president, and General Butler Ames, treasurer, of the Lowell Airport Corporation, are arranging an air meet and an aircraft and industrial exposition in connection with the opening.

SPRINGFIELD NOTES

By Henry P. Lewis

CONGRESSMAN HENRY L. BOWLES has acquired an option on a tract of 350 acres in the town of Agawam, within 10 minutes of the business district of Springfield. It is proposed to develop the field as a private enterprise.

THE Springfield Publicity Club held an "aviation night" program at which Secretary MacCracken, Igor Sikorsky and Maj. Gen. John O'Ryan spoke. Mr. Sikorsky flew to Springfield in one of his new twin Whirlwind amphibians with Raymond White as pilot.

THE youth of Springfield is participating in a model airplane contest, sponsored by the Springfield newspapers and Junior Achievement Foundation. Your correspondent is directing the contest which will culminate in a series of district contests and a grand final when three boys will be selected to represent the city at the national model airplane tournament to be held under the direction of the *American Boy Magazine* in Detroit, June 29 and 30.

The present local records for indoor and outdoor models are held by Matthew Moziek. Mayor Fordis C. Parker is giving three gold medals to go to the winner and three Springfield airplane operating companies are donating the 105 other medals which will be distributed among district and final winners.

THE Massachusetts Airways, Inc., has purchased a Ryan Brougham and will be New England distributors for the planes. The company already handles the Alexander Eaglerock and is operating from Randall Farm in Agawam and the new Barnes Airport in Westfield.

THE Springfield Airlines is distributing Swallows and American Eagles, while the Springfield Airport Company is taking on the Commandair planes.

THE Flying Club of Springfield has purchased a Travel Air to be used by club members for flying instruction, solo work and pleasure hops. The club plans an active season of operation from Dunn Field in Longmeadow.

BOYS! LEARN TO FLY

while preparing for college.

Summer School at Williamstown, Mass., opens July 6th. Thorough course in aeronautics and training in flying. Experienced teachers prepare for all colleges. All sports.

Winter Schools at Pinehurst, N. C., and Williamstown, Mass., open Oct. 1st. Fine winter climate. Outdoor sports. Courses in aeronautics and Business Administration. Junior College courses for graduates of Preparatory and High Schools. Preparation for college entrance examinations. Lower School for younger boys. Send for Booklet.

CAMBRIDGE JUNIOR COLLEGE and TUTORING SCHOOL

Summer School at Williamstown, Mass.
Winter School at Pinehurst, N. C.
N. Y. Office and Day School at 22 E. 74th St.

DENNISON AIRPORT CORP.

Dennison Airport

Five miles south of Boston Post Office.

SCHOOL OF AVIATION

AGENTS FOR

Fairchild	Cabin	Monoplanes
Waco	3-Place	Biplanes
Monocoupe	2-Passenger	Monoplanes

DENNISON AIRPORT ATLANTIC, MASS.

BUTLER STEEL HANGARS ARE FIRE-RESISTANT!



STEEL BUILDINGS PROTECT AIRPLANE CENTER



The American Eagle Aircraft Corporation uses Butler Steel Buildings at its plant in Kansas City. The large building, shown above at the right, is 20′ x 100′, has sliding doors, vent type windows and a full partition; the smaller one at the left is 20′ x 36′, has sliding doors and 9-light windows.

BUTLER HANGARS, like Butler Buildings, are made entirely of steel. So they are non-combustible.

Wall and roof sheets are 24 gage tight coated galvanized steel with deeply drawn paneled corrugations—deeper and wider than mill rolled corrugations. All sheets are bolted together and to a steel frame with *galvanized* bolts. So the construction is rigid!

There is plenty of light in Butler Steel Hangars. Doors, equipped with roller bearing wheels, operate easily.

These hangars are complete. They may be economically enlarged—or they may be taken down, moved to a new location and re-erected with practically 100% salvage.

If you are interested in a steel hangar for one plane or many – or any kind of industrial fire-resistant structure – drop us a line. Full information with attractive prices will be sent to you.

For Refueling Planes:

Butler Truck Tanks will save you time. Tanks are welded, steel. Different compartments hold definite quantities of gasoline or lubricating oils. *Write for prices.*

TRADE STEEL BUTLER PRODUCTS MARK

Butler Manufacturing Co.

Kansas City, Mo. Minneapolis, Minn.

PENNSYLVANIA NEWS

By Ray Krimm

"LINDBERGH DAY", observing the first anniversary of Col. Charles A. Lindbergh's New York to Paris non-stop flight, was celebrated throughout Pennsylvania May 21, with Philadelphia leading in elaborate ceremonies. The Philadelphia celebration included an aviation mass meeting and aerial show at the Philadelphia Airport, an aviation rally of school children in southwest Philadelphia, special exercises by 350,000 children in public schools throughout the city, and a special meeting of the St. Louis Club of Philadelphia.

City officials who addressed the mass meeting at the Philadelphia Airport pledged the administration of Mayor Harry A. Mackey to retain the airport in its present location and to develop it so that it will become the "finest airport along the Atlantic seaboard".

An aerial program was staged under the direction of Major J. Sydney Owens, commander of the 28th Division Air Service, P. N. G., and Robert P. Hewitt, manager of field operations for the Ludington Philadelphia Flying Service.

THE German-Irish fliers, Baron Gunther Von Huenefeld, Captain Hermann Koehl and Major James Fitzmaurice, visited Philadelphia on May 9, arriving at Mustin Field, at the Philadelphia Navy Yard, on the first flight of their brief tour of the country. They were given a tremendous reception by hundreds of thousands of Philadelphians during their brief stay in the Quaker City.

HENRY FORD and Charles L. Lawrence, president of the Wright Aeronautical Corp., received the Cresson medal of the Franklin Institute on May 16. The exercises were attended by Orville Wright.

THE second annual air derby held under auspices of the Berwick Aeronautical Association was staged at Berwick on May 26 and 27. Several dozen pilots from throughout the state attended the ceremonies and carried passengers.

The air derby also was used to dedicate the new airport, which is 100 yeards south of the former Berwick field and on the north side of the through highway. It is within the city limits and faces on West Front Street.

Officers of the Berwick Aeronautical Association include A. A. Whitlock, president; Dr. R. W. Miller, vice-president; Silas McHenry, secretary, and M. D. Beyer, treasurer.

CHARLES TOWNSEND LUDINGTON, president of the Ludington Philadelphia Flying Service; Virgil Kauffman, secretary of the Aero Service Corporation; Harold A. Holbrook, director of public information for Pitcairn Aviation, Inc.; Major Sydney Owens, commander of the 28th Division Air Service; W. S. Green, Department of Commerce aircraft inspector, and W. N. Breingan, inspector from the same office, spoke during the "Aviation Day" luncheon-meeting of the City Club of Philadelphia recently.

THREE thousand pounds of letters, most of them weighing considerably less than half an ounce each, were carried in Pitcairn Mailwings during the first week of service on the New York to Atlanta air mail line.

In a report made public recently, Geoffrey S. Childs, general manager and vice-president of the Pitcairn organization, announced that 159 pounds of mail were carried south from Philadelphia during the first week. That figure included mail taken to the Philadelphia post office from Camden, N. J., Chester, Pa., Wilmington, Del., and other nearby cities.

A SITE for Williamsport's airport has been selected, and the work of improvement of the property is progressing.

The airport is to be located in Montoursville and will cover a total acreage of 162 acres. Hangars will be erected at once to take care of the two planes recently purchased by A. W. Hinaman, of the Hinaman Aircraft Corporation.

INDIANAPOLIS NEWS

By Frank A. White

HEADQUARTERS for visiting air pilots have been completed at Schoen Field, Fort Benjamin Harrison, of which Lieut. Walter R. Peck is commandant. Members of the Exchange Club who took the initiative in getting the quarters were entertained by the enlisted and commissioned personnel of the field, under whose direction the actual construction took place. There are four bedrooms, reception room with large fireplace, administration office, kitchen, bath, and shower.

ARTICLES of incorporation have been filed here for a new concern to manufacture and sell airplanes and airplane motors. The company will be known as the Chevrolet Aircraft Corporation, with Louis, Charles and Suzanne Chevrolet, of Indianapolis, incorporators.

INDIANA AIR NEWS

By R. W. Kellum

THE Hoosier Airport which is under the direction of H. C. Brooks and Bob Shank, has attracted many Indianapolis residents for sightseeing trips. Four new Travel Air ships have been ordered. The field just east of the big oval of the Speedway is ideally situated. Shank recently moved from Huntington, West Virginia, to take up Indianapolis residence.

THE Capital Airways, Inc., Elmer H. Jose president, has been formed. It is the agent for Eaglerock planes. It plans to arrange a port north of Indianapolis. Edward M. Johnson will have charge of a flying school. Air service to Chicago also is contemplated.

THE PRAIRIE FARMER, farm publication, is using a plane in promotion work it usually has carried on by automobile. W. Floyd Keepers, managing editor, has been touring Wisconsin, Illinois and Indiana in a Waco-10 piloted by M. D. Ator, head of the commercial field at Champaign, Ill.

SO. NEW JERSEY NEWS

By Ray Krimm

EDWARD P. WARNER, Assistant Secretary of the Navy in charge of Aeronautics; Admiral W. A. Moffett, chief of the Bureau of Aeronautics; Admiral J. L. Latimer, Commandant of the Fourth Naval District; Congressman Charles A. Wolverton, of the First New Jersey District, and other members of the House Naval Affairs Committee, flew to the Crescent Airport, Camden, from Washington, late in May to attend the seventh annual banquet of Corporal Raymond C. Thoirs Post No. 47, American Legion.

Two Challenger planes of the Crescent Air Service, Inc. and a special detail of planes from the Philadelphia Navy Yard met the visiting planes and escorted them to the airport. Several hundred Legionnaires gathered at the airport to greet the incoming fliers. Five hundred attended the banquet. The guests returned to Washington the following day by plane.

CHARLES ABLE, of Ocean City, and Larry Kelly, of Collingswood, have secured the exclusive privilege of flying operations on the beach at Ocean City and have started operations with a new three-place OX-5 Challenger recently purchased from the Crescent Air Service, Inc.

THE hangar being constructed by the Burlington County Aero Club, at their airport near Moorestown, is about completed and the building is ready to receive the club's first plane, a new Waco-10. The hangar is all steel and is 50 by 50 feet square. The field will be dedicated in the near future.

BADER FIELD, Atlantic City's municipal airport, is being materially improved. Additions are being made to the airport's 50 acres, with a 100-acre airport in prospect for the immediate future and additional increases in acreage promised by the city as they are needed.

ATLANTIC AIRWAYS, Inc. of New York has leased 4,000 square feet of space at the steel pier Atlantic City, N. J. for display purposes. The Alexander Eaglerock plane which their company distributes will be exhibited. There will also be a display of aircraft accessories. Plans include commercial operations of land and seaplanes and an aviation school. J. W. Overturf is the Atlantic City manager.

STARTING modest operations at the William Penn Airport, Roosevelt Boulevard and Red Lion Road, Philadelphia, on April 1, the Keystone Flying Corporation has developed one of the finest flying fields in the Philadelphia district.

In addition to carrying passengers the company has a complete flying school. George R. Hutchinson is field manager; Captain Fred Lorillard, chief pilot; Albert Grahan, associate pilot; Paul Linler, chief mechanic and G. M. Hutchinson, office manager. C. W. Larner is president of the corporation, C. C. Tutwiler, vice-president; and Will Henry Tutwiler, secretary-treasurer.

LEARN TO FLY
at a PITCAIRN SCHOOL



IN VIRGINIA

Pitcairn Aviation of Virginia, Inc., operators of Richard E. Byrd Field at Fort Lee, Va., the municipal airport of Richmond. Byrd Field is a regular stop on the New York-Atlanta air mail line. Located seven miles east of Richmond close by Fort Lee station of C. & O. Railroad.



IN NORTH CAROLINA

Pitcairn Aviation of North Carolina, Inc., operators of the Greensboro Municipal Airport, at Friendship, ten miles west of Greensboro. A regular stop on the New York-Atlanta air mail line and a center of constant flying activity.



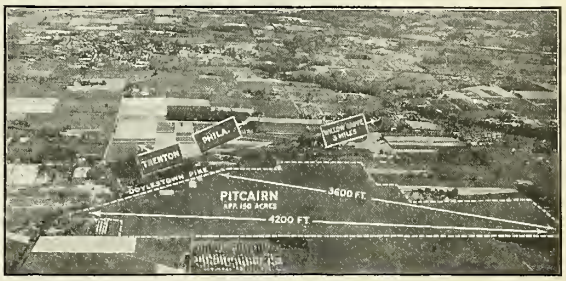
IN SOUTH CAROLINA

Pitcairn Aviation of South Carolina, Inc., operators of the Spartanburg Municipal Airport, three miles southwest of the city. A regular stop on the New York-Atlanta air mail line.



IN GEORGIA

Pitcairn Aviation of Georgia, Inc., operates at Candler Field, the Atlanta Municipal Airport. Located at Hapeville, eight miles south of Atlanta. The terminal of the New York-Atlanta air mail line and the Atlanta-New Orleans air mail line.



PITCAIRN FIELD, PHILADELPHIA (WILLOW GROVE), PA.

IN PENNSYLVANIA

Pitcairn Aviation of Pennsylvania, Inc., operators of Pitcairn Field at Willow Grove, just north of Philadelphia. The largest commercial flying field east of the Mississippi. Training at Pitcairn Field offers the special advantages of close proximity to the Pitcairn aircraft factory at Bryn Athyn, Pa., where all phases of construction may be observed.

The Pitcairn method of training pilots is unique. It is based upon Pitcairn experience as manufacturers of airplanes, as air mail contractors and as extensive commercial operators of airplanes, resulting in an intimate knowledge of just what a pilot should be taught to qualify for private flying and general commercial work.

The Pitcairn method of instruction has been so successful that there are now five schools operating in five eastern states. Each school is located on a commercial airport, giving students the advantage of intimate contact with commercial flying operations.

Courses of ten hours, twenty hours and fifty hours are offered, each course being supplementary of the next shorter, allowing a change to longer courses without interruption of study. The courses closely parallel those of military service schools and are conducted all-year-'round. Reasonable board and lodging may be obtained near each field.

Anyone interested in learning to fly should investigate the Pitcairn Schools before making a choice. A booklet giving detailed information on Pitcairn methods of instruction with a synopsis of courses offered, and setting forth the many advantages of the Pitcairn Flying Schools, will be mailed at your request. Write for it today.

PITCAIRN AVIATION INC.

LAND TITLE BUILDING, PHILADELPHIA

OHIO AIR NEWS

By T. E. Lunsford

ARRANGEMENTS have been completed for use of the Columbus airport, Sullivant Ave. and Georgeville Road, by air mail planes which begin service June 1 between Cleveland and Louisville. One hangar is under construction and beacon lights will be installed for night flying.

AVIATORS and aircraft flying over Columbus on and after July 1 must be licensed by the U. S. Department of Commerce or be subject to a $100 fine or ten days in jail or both, by the terms of an ordinance passed by the City Council of that city.

CONSTRUCTION work has started on an airport for Columbiana County. The field is located on a tract a half mile north of Stop 55 on the Lincoln Highway out of East Liverpool.

WITH Clarence D. Chamberlin, transatlantic flier, as guest, Mansfield recently dedicated its 189-acre municipal airport.

AMONG the exhibits at the recent air show held by the Columbus Aero Club at the Lazarus Department Store was a stripped Curtiss Jenny, with placards telling the public the name of all parts; a model airport; a seven-foot replica of the navy dirigible *Los Angeles*, sent by the Goodyear Company of Akron; three engines, a Curtiss OX-5, Hisso and Liberty, mounted on blocks; airplane models submitted by the Model Airplane League of America and the Junior Aero Club.

COLUMBUS is to have a complete commercial airport, within the next few months, operated as nearly as possible like a municipal establishment, it has been announced by Ross Harris, president of the Commercial Airway Transit Corporation of Ohio. The field embraces 100 acres, and is 15 miles by automobile from the Columbus post office.

THE Lima Aero Club was organized at a meeting held recently at the Superior Aircraft Field. F. H. Colby was named temporary secretary. Flying lessons will be given by "Red" Couples, chief pilot at the Superior Field.

THE Urbana Flying Club was organized with the specific object of properly marking a field where airplanes may land near Urbana. Officers of the club are: Herman Harner, president; Charles N. Greene, treasurer, and Job Stevenson, secretary.

DESPITE the fact that new regulations, governing mostly commercial flying, have been declared to be unusually "stiff," they are favored by Dayton aviators. Copies of the new regulations were recently received at the Dayton field.

By the new rules, aviation instructors will be required to have 200 hours solo flying instead of 50 before training new pilots. Persons flying private planes must have 10 hours alone in the air before obtaining their certificates. Pilots and mechanics must pass their examinations for license with a grade of 70 per cent in each subject included instead of with an average of 70 per cent for all subjects.

H. C. YEISER, JR., was chosen president of the Metal Aircraft Corporation of Cincinnati, recently organized with an authorized capital of $500,000. Other officers chosen are: Julius Fleischmann, first vice president; Powel Crosley, jr., second vice president; Thomas E. Halpin, third vice president; Ralph R. Graichen, fourth vice president; John B. Hollister, secretary; Daniel Schryber, treasurer; T. E. Halpin, general manager. The following were chosen directors: E. F. Lunken, T. S. Goodman, John C. Hermann, T. Higbee Embry, W. H. Chatfield and J. J. Rowe.

International Corp. New Factories

THE International Aircraft Corporation officially dedicated its new factories and auxiliary flying field at Cincinnati, with the official recognition of the Cincinnati Chamber of Commerce and the American Legion.

The factory colony, consisting of four factories and separate office building, were open to the public throughout the entire afternoon, with all departments and all workers on duty. More than 10,000 people visited the factory in the afternoon.

Clarence D. Chamberlin gave the signal that started the American flag aloft over the factories—the dedication ceremony. Mrs. H. A. Speer, wife of the vice president and sales manager of the company hoisted the flag.

CLEVELAND AIR NEWS

By David E. Irwin

ANNOUNCEMENT of two passenger airlines between Cleveland and Chicago was made last month. Stout Air Services, Inc., operators of the Cleveland-Detroit airlines, and the United States Airways Co., recently organized in Chicago, are to operate the lines.

Stout plans to run, in addition to the present Cleveland-Detroit line, a Chicago-Cleveland and a Chicago-Detroit, forming a triangle of passenger lines. Planes are to leave the terminals both in the morning and afternoon, under present plans. The scheduled flying time from Detroit to Chicago will be two and a half hours.

The other Cleveland-Chicago line is expected to be put into operation in July. Twelve cabin planes have been purchased from the Hamilton Metal Plane Co., Milwaukee, according to P. S. Kemp, managing director of the new airways company. Two planes are to be flown each way daily.

THE Clifford Ball airline, which has the mail contract between Cleveland and Pittsburgh, opened air express service April 30.

The planes leave Cleveland airport at 12:15 p. m., connecting with the eastbound N. A. T. due at noon, and arriving in Pittsburgh, 2 p. m. Return service from Pittsburgh at 2:30 p. m., arriving Cleveland to connect with the N. A. T. from the west at 4:35 p. m. Arrangements are to be made for an intermediate stop at Youngstown.

A SPECIAL committee to study and promote aviation in Cleveland has been appointed by the Cleveland Advertising Club.

Those on the committee are: Ralph Leavenworth, chairman; I. I. Sperling; John E. Wiley; Richard S. Rimanoczy; Irving Silverstein; Paul Laferty; George E. Mills and H. C. Treharne, the last two secretary and assistant secretary of the club, respectively.

THE Thompson Aeronautical Corporation of Cleveland has been awarded the contract for air mail between Chicago-South Bend-Detroit, with 11 other Michigan towns on way-routes. The corporation's bid was 89 cents a pound. They expect to get into operation about July 1.

A fleet of six planes, four of them Stinsons, are to be operated over the route.

Besides Chicago, South Bend and Detroit, the route touches Kalamazoo, Battle Creek, Jackson, Ann Arbor, Pontiac, Lansing, Flint, Saginaw, Bay City, Grand Rapids and Muskegon.

THE John S. King Co. national advertisers with offices in Cleveland, purchased a four-seater Stinson-Detroiter last month for use of the Cleveland office.

THE American Eagle of the Becker Roofing Co., used by officials of the concern, ended a 5,000-mile tour of the country April 28. H. R. Mull piloted the ship.

W. A. Keller, manager of the company, will use the ship to visit the 31 branches of the concern in various parts of the country.

TOLEDO AIR NEWS

By David B. Hoag

TOLEDO'S new municipal airport located one-half mile south of Walbridge, O., and one mile east of Moline, was opened and dedicated on April 28. A brick and steel hangar has been completed, beacon lights have been installed and a contract for the placing of flood lights has been let.

WESTCHESTER AIRWAYS, INC., now operating at Long Island, N. Y., has established a branch in Toledo. Lieut. Harry J. Runser is managing director and pilot while Capt. C. Goodsell, recently stationed at Selfridge field, will assist him. One-hour service to Cleveland, two-hour service to Chicago and five-hour service to New York will be given by the company.

SKY-WAY, INC., recently formed by Thomas R. Manton, and Lyell K. Lewis, are specializing in carrying passengers on short hops over the city. One Waco plane is in use and two others have been ordered.

— SIMPLEX —
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Say you saw it in AERO DIGEST

ST. LOUIS AIR NEWS

By A. W. League

ST. LOUIS has one of the most up-to-date airports in the country when it comes to flying equipment. Von Hoffmann tops the list with three Ryan Broughams, a Hisso Ryan, three Eaglerocks and a Pheasant. Parks Airlines have clinched second place with a half a dozen Travel Airs and more coming in as fast as they can get 'em, plus a couple of Standards. Phil Ball, who owns the St. Louis Browns Baseball Team, has a Ryan Brougham and Frank Dunn pilots him all around the country in it.

The Robertson Aircraft Corporation has a Ryan Brougham which they use in the air mail. They also have a Whirlwind Travel Air and I hear they are going to order a couple more Whirlwind jobs. The poundage on the mail has shown an increase and the passenger service has averaged two a day for the past few weeks. Besides all of these ships, we have five Waco-10s, another Whirlwind Travel Air, a Whirlwind Ryan M2, two more Eaglerocks, one Laird Commercial, one Waco-9 and the first Travel Air built, which belongs to O. E. "Scotty" Scott. Even though it is the first one built, it still holds its place with the rest of the commercial jobs on the field.

SINCE the city took over the field, things have started to happen. Von Hoffmann Aircraft Company is erecting two new hangars costing $20,000 each. Construction work on the B. F. Mahoney Aircraft Company's new factory and the Curtiss-Robertson Aircraft factory is going along at top speed and from all indications it won't be long before they will be turnin' 'em out. The Robertson Aircraft Company is reconditioning all the OX motors that they have sold to the Curtiss-Robertson Mfg. Co.

I NEARLY forgot to tell you about our new company. You remember Phil Love who used to fly the mail with "Slim" from St. Louis to Chicago and who later joined forces with the Department of Commerce, then started out to peddle Fairchilds—well, Phil and Preston Sultan are now airport consulting engineers. Sultan is an old timer with a war record of four Dutchmen and between the two of them they are ready to consult anybody on anything pertaining to airports. Their first job was the construction of a hangar on the new Parks Airline field just south of East St. Louis, Ill. That's sure going to be some airport when it is finished—just 20 minutes from downtown St. Louis. Parks has the agency for the Travel Air and they say that sales are pretty good. Clyde Brayton is their chief pilot. The Travel Air Company is building a number of planes for Parks Airlines designed especially for student instruction.

WE are all praying for November to come around, not because we are crazy about the weather but because that is the month when we vote for our $1,000,000 airport. We have firmly resolved to put it over if we have to go out campaigning for it. And speaking of "campaigning"—Allen T. Spivey an E. St. Louis newspaper man has engaged two Travel Airs to "stump" the state of Illinois in his campaign for congressman. The ships will probably be flown by Joe Hammer and Clyde Brayton both of the Parks Airlines. They plan to visit all the leading towns in the state of Illinois and we hope that when Allen T. gets through telling 'em what a great thing it would be for them to put him in Congress he will say a few words for aviation along with it. I don't know what political party he belongs to but if he is "airminded" he must be all right and I wish him lots of success.

MOTHER nature is not the only one to let us know that spring is here. All the fair weather pilots are getting their crates out and are touching them up a bit. Art Heman has been kept busy lately with his Duco spraying outfit adding a touch of color here and there to fuselage and motor cowlings. When Art gets through our field will look like a nest of Easter eggs from the air.

THE National Guard Squadron is the proud possessor of two new Curtiss Falcons and believe me they sure are piling up time on these new jobs.

THE Naval Reserve outfit tells us they have just about got their "Jenny" dolled up for the spring and summer flying session. There is a bunch of boys who sure deserve a lot of credit! They are all good mechanics and good fliers, but the Navy Department refuses to recognize them as far as giving them equipment is concerned. However, that didn't discourage them one bit. They saved up their dimes and nickels and bought an OX Jenny. The Navy Department didn't want 'em to fly but they put one over on them. They have been waiting two years for recognition from Washington but with no luck. In the meantime ,they are flying the old Jenny on and on. Something should be done about that.

ANHEUSER-BUSCH & CO. has purchased a Ryan Brougham from Von Hoffmann Aircraft and Joe Hammer has been elected as pilot. E. R. Coyle, general sales manager for Anheuser-Busch, and Joe Hammer are touring the southwest in the new brougham making a preliminary survey of the trade routes and sales territory in that section. As soon as routes are laid out a fleet of six planes will be put into service to carry salesmen.

GEORGE LAMBERT is the proud possessor of a new Siemens-Halske Travel Air which he purchased through the Parks Airlines, Inc. Several of the boys flew the new job and they all voted it lots of praise. The Von Hoffmann Co. has a new Siemens-Halske Eaglerock which is a very nice looking job.

BILL CHAUDET of the General Brake Service Co. has purchased a Travel Air from the Parks Airlines for business trips. Chaudet is somewhat of a flier himself but a chap by the name of "Gilly" is to be his pilot on cross-country trips.

THERE is another new field being laid out close to St. Louis. It is being built by Oscar Johnson, wealthy young St. Louis sportsman, who recently bought a Whirlwind Travel Air and engaged 'Boots' Dempsey to fly it for him. The field is a 60-acre tract on the banks of the Missouri River at St. Albans, Mo. and is a part of the country estate of Johnson's mother.

'BLIND FLYING' BUD GURNEY broke the record for the mail run between St. Louis and Chicago, making the run of 227 miles in 1 hour 54 minutes. The time included two stops for mail—one at Springfield and one at Peoria.

AIR express service was started May first when three Robertson Aircraft Co. ships took off for Chicago with the first load. About fifty packages were picked up at Springfield and about fifteen at Peoria besides the usual mail consignment.

THE Post Office Department awarded the Robertson Aircraft Co. the contract for the air mail route from St. Louis to Omaha by way of Kansas City. The planes will leave St. Louis at 8:00 p. m., making Kansas City at 10:30 p. m. and enabling the mail and passengers to reach their destination in Texas or the Pacific coast the following day. The Robertson bid was 78.5 cents per pound. They are also bidding on the shuttle route to Evansville, Ind., which will connect with the route from Chicago to Atlanta.

PASSENGER business on the mail line has shown an enormous increase the past few months. In fact it is so large that the Robertson Co. has established a downtown ticket office for the convenience of everyone concerned.

WE are all glad to hear that the City has retained O. E. (Scotty) Scott as field manager. The city took over the operation of Lambert Field sometime ago and considerable excitement was stirred up for fear that the City officials would make it a political job and put some 'swivel chair' dub in charge of the field who did not know a thing about aviation. That sure would have been a calamity but it didn't happen and we are all satisfied. Scotty was appointed field manager after the Air Races in 1923 and has served faithfully ever since.

THE boys at the field got their first look at the new Curtiss-Robin the other day when "Slim" Lindbergh and Major Robertson flew to St. Louis from Washington, D. C. Quite a bit of interest has been created over the new job which is considerably different from most of the low priced commercial jobs on the market.

AFTER many months of tedious work, the Robertson Aircraft Corporation has completed its new parts catalog. It is of handy size, being 5½ x 7¼ inches, has 128 pages, and contains 72 illustrations. In it a brief history of the organization and its officers is given. It also contains an index of thousands of airplane and motor parts. Information of value to pilots and mechanics pertaining to motors, carburetors, and magnetos, is also given.



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WICHITA AIR NEWS

By Edwin W. Pryor

WICHITA believes in air mail. Stewart Young, postmaster, the week of May 12 submitted a report showing that the N.A.T. carried 11,636 pounds of air mail from this city during the year just passed, as compared to 7,731 pounds for the first year of its existence.

PLANS for the erection of Aeronautical Hall are being worked out by the board of regents of the University of Wichita. Aeronautical classes were started this spring, and the classrooms are so crowded already that the regents believe the erection of a separate building for the school of aeronautics will be necessary next year.

Local men attached to the six airplane factories in Wichita, and army pilots from Fort Riley are conducting the classes.

THE first ship of the Lark Airplane Company will be completed and given test flights soon. The plane already has been purchased by C. C. Baldwin and Russell Van Sickel of Wichita. It is a cabin biplane powered with a Wright Whirlwind engine, seating six persons including pilot.

THE Wichita Air Service Provision (Wasp) Company opened at the Wichita airport on May 20, offering practically every branch of air service. The company now owns three planes—two Travel Air biplanes, and one cabin monoplane. A Swallow biplane has been ordered and a Stearman will be purchased immediately for fast cross-country work.

Charles Lander will be instructor and manager of operations; Preston Kirke, chief mechanic. Officers of the company are: D. E. Sauder, president; Robert Hasy, vice-president; Aaron Greenleaf, treasurer; W. E. Titus, secretary, and Lander, manager of operations.

MRS. ESTHER M. WARNER, wife of H. P. Warner, sales manager for the Quick Air Motors Company, has returned after a two-month tour of Europe by air. With Miss Mildred Johnson, well known writer and lecturer, Mrs. Warner visited all the larger cities of Europe as guest of the various airlines. The two women covered about 9,000 miles by air during the two months.

WILLIAM M. BREINGAN, one of the first Department of Commerce aviation inspectors, is in Wichita studying the possibilities of conducting factory inspections. If possible, the department plans to license ships before they leave the factory, and "Scotty" Breingan has been assigned the duty of working out a system whereby that will be possible. He will remain in Wichita about three weeks, spending most of his time in the Travel Air factory.

"Scotty" was a member of the British air forces in Palestine, and the first air mail pilot on the Cairo-Bagdad run.

J. DON ALEXANDER, of the Alexander Eaglerock Company, has contracted for a number of Quick airplane motors. The motors are converted Le Rhone rotaries, made into static radials by C. E. Quick.



An "Aerovane" used on main highways

WICHITA was "attacked" by a fleet of 48 army planes Thursday, May 17. The planes, on their way to Fort Riley for maneuvers, circled the city. Brigadier General D. D. Foulois was included in the personnel of the party.

W. M. MOORE of Wichita was elected president of the Swallow Airplane Company at a recent meeting of the stockholders. He succeeds Jack Turner, who has disposed of his Swallow holdings to concentrate on Travel Air, of which company he is vice-president.

A. E. Merriam was elected director to succeed Mr. Turner. Other directors, re-elected, are J. W. Craig, C. A. Noll, and W. B. Harrison. Victor Roos was re-appointed manager of the company, which is now on quantity production.

Six Swallow planes were delivered recently to Williams & Shoblanska, Swallow dealers of Milwaukee, Wisc.

A SECOND All-Kansas Air Tour, sponsored by the Wichita Chamber of Commerce and the Wichita N. A. A. chapter, is due to take off June 4 for a six-day flight through west Kansas. The first tour was held April 2-7, and visited eastern cities in the state.

F. W. HOCKADAY is in Washington, D. C., conferring with officials of the Department of Commerce in completing plans for the uniform system of airways marking, the subject at a conference in Wichita May 10 and 11.

Hundreds of plans for marking systems were submitted to the conference, and the department will weed them out, perhaps consolidating some, and determine upon a definite system which will be announced at another conference in the near future.

THE local government aircraft inspectors have been relieved and transferred. Richard H. Lees goes to Louisville and E. W. Day to Dallas. C. A. Brukman and Lt. James H. Collins of Chicago succeed Lees and Day and have established their offices with the Wichita Chamber of Commerce.

Airway Marking Conference

THE Aeronautical Division of the Wichita Chamber of Commerce, Wichita, Kansas, realizing the importance of airway and airport markings, called a conference on May 10th and 11th to discuss and develop a uniform system for that purpose.

In conjunction with this event, a prize was offered for the best system submitted by firms or individuals interested in this line of work.

The conference was well attended and all sections of the United States represented. Secretary William B. MacCracken, jr., head of Aeronautics Branch of the Department of Commerce, headed the list of speakers and judges. The Army, Navy, Post Office Department and Weather Bureau were also represented and acted in judicial capacity regarding the contest.

The first prize was awarded to Aero Guides, Inc. of New York City and represented by R. B. Bevier and C. F. B. Roth. The second prize was awarded to J. M. Knight of Severy and J. D. Wood of the Department of Public Works, Boise, Ind. was tied with H. Don Snodgrass of Jenks, Okla. for the third prize, both entries being very similar in design and idea.

THE AEROVANE

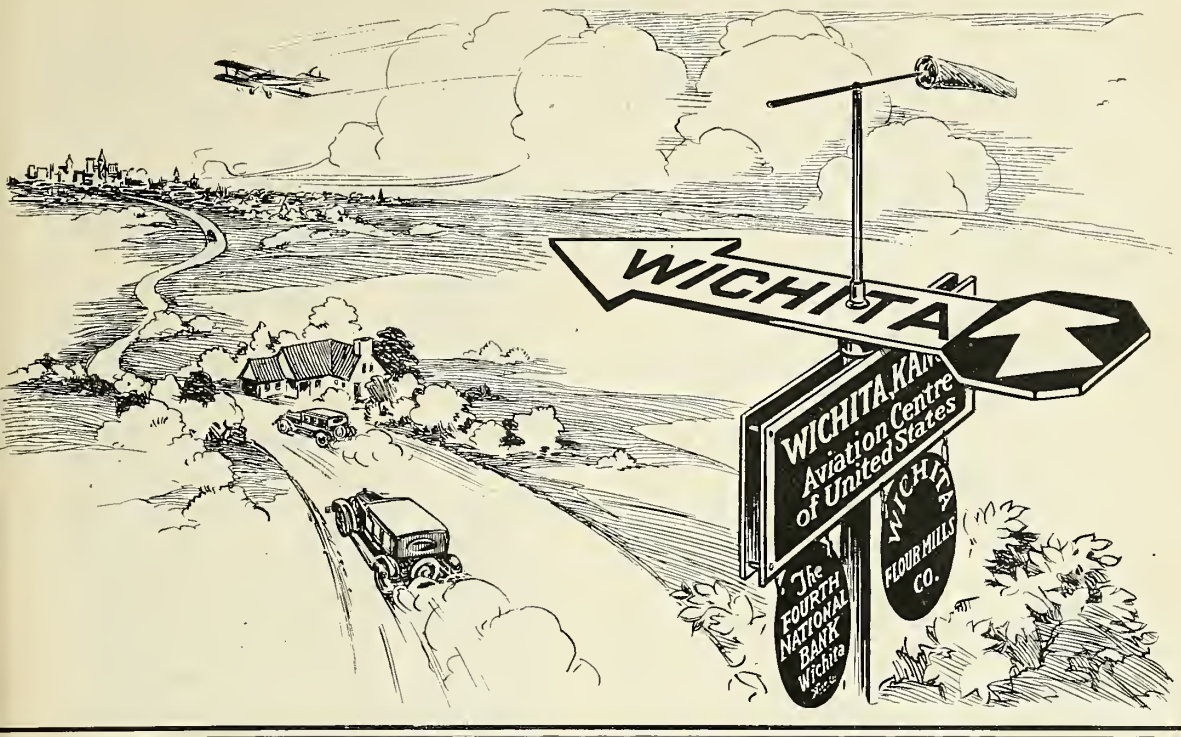
THE Aerovane Utilities Corporation of New York plans to place on the right hand side of every main highway leading into a town or city a new standardized airway marker, combining wind direction, compass bearing, and the name of the community over which the plane is flying.

The new marker, called the Aerovane, was demonstrated and shown for the first time at Wichita, Kansas, at the Airways Marking Conference. The marker consists of a structural steel pole, 6 inches in diameter, and 25 feet in height. Anchored at the very tip is a wind sock, 3 feet in length. Located 8 feet below, and centered on a horizontal plane, is a large arrow, 13½ feet long. This arrow, painted a chrome yellow, has the name of the town to which the arrow is pointing, lettered in black. On the tail of this arrow, which is a 3-foot square painted in black, is superimposed a smaller arrow, painted white, which is in a fixed position pointing true north. This indicates compass direction to the aviator.

Located 6 inches below this large arrow is a sign board, 8 x 3 feet in size, for road travel information. On it, painted in white letters, will be carried the name of the town, and, perhaps, its slogan. Hanging from this sign, one on either side of the upright, will be two circular panels, 42 inches in diameter, which will be rented by the leading business interests of the community, and which provide the revenue for erection and maintenance of the airway marker.

Thus, an aviator wishing to determine his position, can follow any main artery of ground travel and pick up a marker. Provision has been made for electrically floodlighting the arrow wherever and whenever desired.

The Aerovane Corporation has been organized under the laws of the State of Delaware, with the following officers and directors: John J. White, president; D. A. Griffith, vice-president; J. E. Doran, second vice-president; J. G. Mahony, secretary and treasurer.



AEROVANE

An Aid to the Air Traveler

WITHIN the next twelve months, Aerovanes will be erected along the main highways leading into every city and town in the United States—making it possible for you to instantly locate your position from the air, anywhere, at any time.

Consisting of a structural steel pole six inches in diameter and twenty-five feet in height, the Aerovane combines the three fundamentals essential to the proper guidance of the flyer—

A wind cone three feet in length anchored to the very tip of the pole. Below this, centered on a horizontal plane, is a large arrow thirteen and a half feet in length—with the name of the town towards which the arrow is pointing lettered in black on a brilliant chrome yellow background.

On the tail of the arrow, which is a three-foot square, is superimposed a smaller arrow in white in a fixed position true North.

Aerovanes will be placed on the right side of every main highway on the outskirts of all cities and towns. Under normal conditions the Aerovane will be visible to the flyer at a height of 3,000 ft.; and readable at a height of 1,000 ft. Arrangements may be made to illuminate the arrow and signs at night.

We invite inquiries from pilots, airports, airport committees, aero clubs, Chambers of Commerce, municipalities, and others interested in aviation.

AEROVANE UTILITIES CORPORATION

292 Madison Avenue **New York, N. Y.**

NORTH CENTRAL NEWS

By Harold Alexander

THE Great Lakes Airways Corporation has organized in Duluth with a capitalization of $100,000. W. E. (Doc) Sickner is president, with Ken Pettit, a former Army flier, as chief pilot. At present an American Eagle, for which they have the agency in addition to that of the Ryan monoplanes, is operated from a field just outside of the city limits.

FLYING activities at the Superior field, formerly known as the Arrowhead Airways field, have been hampered and proposed trips of visiting ships have been postponed because of the muddy condition of the field. Runways are now being laid out and graveled so as to be in good condition for other than fair weather flying.

C. M. Peterson, pilot for the Superior Airways, was formerly a flier in the Twin Cities. This company is getting ready for the summer season.

ROCHESTER AIRWAYS of Rochester, Minn., is the Travel Air dealer in that part of the state, having been selected by the Roth-Downs Airways of St. Paul, the Minnesota distributor of Travel Airs, the Driggs Dart and the Monocoupe. The customary flying activities, such as student instruction, passenger carrying and cross-country flights, are carried on with the Rochester field as the base of operations. T. J. Moore is president of this organization and George Steinkie is the chief pilot.

THE Minnesota Aircraft Co., Eaglerock distributor within the state, will increase its facilities to meet the constantly increasing demand, and construction of a 60 x 80 foot hangar will be started immediately at Wold-Chamberlain airport. Jack Anderson, chief pilot, has made a number of trips to various parts of the state with L. W. Chandler, president of the company, as passenger for the purpose of establishing Eaglerock dealerships.

AN airport for Yankton, S. D., is assured for the local Chamber of Commerce and a group of business men have obtained a 70-acre tract of land adjoining the state hospital on the west and three miles from the center of town. The property is to be improved at once and four-way runways will be laid out.

DURING a recent board of directors meeting, the Mid-Plane Sales & Transit Co. of Minneapolis voted to double their capitalization. In addition to distributing the Fairchilds, this commercial aviation organization also handles the Command-Aire manufactured by the Arkansas Aircraft Co. of Little Rock, Arkansas. There are about fifty students receiving instructions on either the Waco or Command-Aire.

AIR SERVICE, INC. of Minneapolis, is offering a special course during the summer season. This training is restricted to college men and is to cover a period of three months with the initial class being held on June 18th.

AERO INDUSTRIES, INC. is designing and building a new plane that will be placed on the market within the near future. In addition, the Ace High College of Aeronautics is being conducted by this organization. The officers of the Aero Industries are: J. B. Skorstad, president; V. L. Jones, vice-president and general manager; G. F. Mantz, secretary; R. S. Doll, treasurer; Arthur B. Glessner, chairman of the board of directors.

WHEN Capt. George Wilkins and his pilot flew over the top of the world in their Lockheed plane the people of Hatton, N. D., rejoiced for Lieut. Ben Eielson calls that place his home town. Preparations are being made to accord him a reception worthy of a hero on his homecoming.

WISCONSIN AIR NEWS

By Roy Leavitt

THE Larson brothers of Larson have added a Whirlwind Waco-10 to their fleet and are getting ready for a big summer's business.

CLASSES at the George A. Whiting airport, Appleton, started May 7.

An airplane meet will be held at this airport July 28 and July 29, sponsored by the Appleton Chamber of Commerce.

W. L. KOEHN and A. W. Sommer of Sheboygan have purchased three Waco planes and will use them for hopping passengers at Green Bay and Sheboygan.

(*Continued on page* 1024)

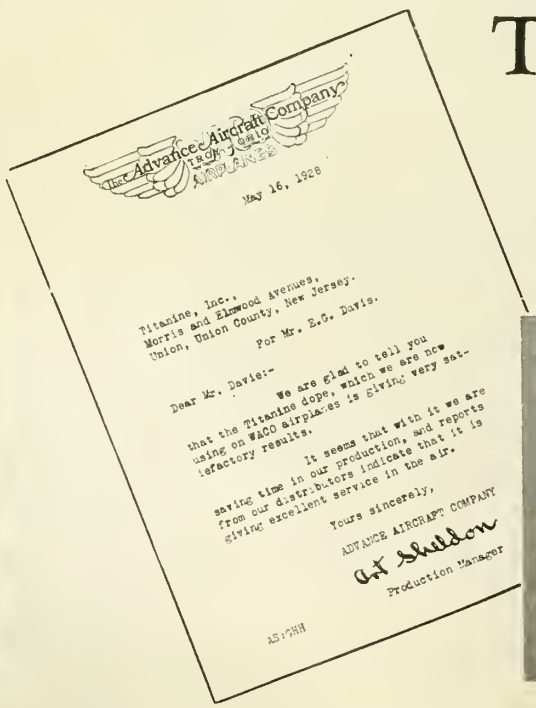
The WACO-10 is now finished with TI-TWO DOPE

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Quantity production necessitates High Quality and Economy


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TRAVEL AIR
AIRPLANES

May 16, 1928

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For Mr. E.G. Davis.

Dear Mr. Davis:-

We are glad to tell you that the Titanine dope, which we are now using on WACO airplanes is giving very satisfactory results.

It seems that with it we are saving time in our production, and reports from our distributors indicate that it is giving excellent service in the air.

Yours sincerely,

ADVANCE AIRCRAFT COMPANY

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AS:HH



WACO-10, "WHIRLWIND"

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For the first time, in non-technical, plain English, here's a new book that gives you the whole theory and practice of Aviation. Its 128 pages and 49 illustrations take all the mystery out of this increasingly important subject.

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What ever your interest in Aviation—whether you plan to fly, whether you are now "taking time" or are merely interested in posting yourself on aviation—here, at last, is the most practical way of doing it in the shortest time.

Notice to Flying Schools

Your students will solo in one-third less time, and will be better fliers at the end of their training if they read this book before taking instruction. Prices to wholesale users on request.

JUST USE THIS COUPON

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Here's my dollar. Rush me postpaid a copy of "The Modern Airplane."

NAME (Print) .....

ADDRESS .....

ROTH-DOWNS AIRWAYS, Inc., Saint Paul, Minn.

(Wisconsin News continued)

STEVENS POINT has acquired a tract of 67 acres east of that city for an airport. J. W. Dunnegan, E. A. Oberweiser and J. A. Week put up the money for the land. An organization has been formed to take over and develop the project.

MANY of the visitors on the peninsula of Door County on "Cherry Blossom Sunday" viewed the beautiful scene of thousands of acres of cherry trees in bloom from the air.

Reynolds brothers, chief among the cherry growers of the district, constructed a 100-acre airport during the past winter and the North American Airways Company kept their Stinson monoplane busy carrying passengers.

E. R. THOMPSON, who has obtained control of a 4,000-acre island in Green Bay and is going to open it as a resort, has contracted with Lester Nebel of Sturgeon Bay, to complete an airport on the island in 30 days. There will be two runways, 2,800 and 3,000 feet long. Two Ford trimotored planes will be used for service between the island and Chicago, with service starting the latter part of June.

ATKINSON AVIATION COMPANY'S SCHOOL

THE offices and primary training shops of the Atkinson Aviation Company's School of Aeronautics are located in the heart of the business section of Gary, Indiana, in a new fireproof building. The school is equipped with the latest type of equipment, and the shops, consisting of the woodworking shop, the assembly shop, the fabric shop, the motor shop, the welding department, and the final assembly and inspection departments, are complete in their methods and modern in their mechanical appliances.

Many times, since the opening of the training course, the members of the shops have gone out into the country to pick up the wreckage of a ship which has "cracked-up." A telephone message to the Atkinson Aviation Company brings the word that trucks from the school will be on their way to assist immediately. The charges for repairing ships are just the cost of the materials used in the work, plus the hauling charges for the trucks, at the rate of twenty cents a mile. The students are always working upon the latest types of ships, so that their knowledge is up-to-date.

At the airport the seven planes of the company are in use in the training of pilots, under the able supervision of Lieutenant Robert (Bob) Minick. All ships bear Department of Commerce license numbers. L. H. Atkinson is the manager of the company and George Schaeffer, school engineer.

The distributorship for Monocoupe airplanes for Indiana has been awarded to the Atkinson Aviation Co., who have received delivery of the first of fifteen Monocoupes ordered during May.

MINNESOTA AIR NEWS

By W. S. Schley, Jr.

CONSTRUCTION of the first of a series of new hangars involving an expenditure of approximately $100,000 at the Wold-Chamberlain airport, of Minneapolis, was started recently following the final approval by the park board aviation committee.

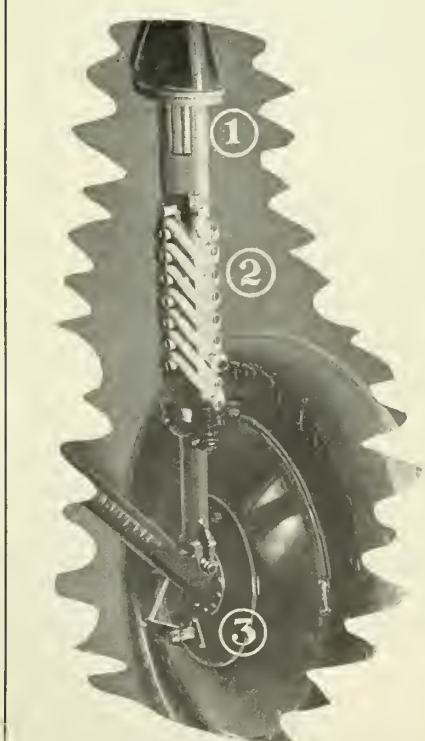
Rufus R. Rand, Jr., president of the Mid-Planes Sales and Transit Company, has started construction on his $20,000 all-steel hangar and "airplane depot" for use in connection with an extensive passenger and express service to be put in operation as soon as arrangements can be completed.

Two other companies are building hangars; one for the Minnesota Aircraft Company and the other, by the Marvin A. Northrop Company.

NATIONAL GUARD airplanes will be used to combat poachers and illegal transporting of furs from the Superior State Game refuge in the Superior National forest, according to J. F. Gould, Minnesota game and fish commissioner.

THE Sterling biplane was tested May 8 and will be under production in a Minneapolis factory within a short time according to officials of the newly formed Sterling Aircraft Co. The plane was tested by Gene Shank.

The plane is powered with a 90 horsepower OX5, lands at 30 miles an hour, a maximum speed of 104 miles an hour is developed and has a cruising range of 500 miles.



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TEXAS AIR NEWS

By Mont Hurst

THE United States Army Air reserve squadron will be removed from Love Field, Dallas, as soon as a suitable location for a new field can be secured. Major Josef Noyes, commanding officer of the 366th Observation Squadron, and Lieut. Weddington are inspecting sites for a new field. The increase of private and commercial flying at Love Field is the cause of the move.

CITY COMMISSIONER ARTHUR J. REINHART of Dallas has announced that the city will purchase another site for an airport with the $75,000 left over from the money set aside for the purchase of Love Field. The new airport will serve as a base for the 366th Observation Squadron of the Army Reserves and will be used as a field where airplane factories and industries can be started.

DURING the Democratic Convention to be held in Houston a Ryan monoplane will be operated from Dallas to Houston each morning by the Texas Air Transport to carry visitors and delegates to Houston. Another plane will fly daily from Fort Worth to Houston.

TEXAS AIR TRANSPORT opened flying schools in Fort Worth, San Antonio, and Houston in May with Fort Worth as the center of training activities. Primary schooling is given at San Antonio and Houston with advanced training at Fort Worth. Students will be flown to Fort Worth for advanced work.

PASSENGER service has started on the Houston-Dallas and San Antonio-Dallas air mail lines. Passengers may depart from Houston at 4:30 p.m. daily and arrive in Dallas at 7:37 p.m. Departure from Dallas is at 7:15 a.m. and arrival in Houston at 10:50 a.m. Stops are made at Fort Worth and Galveston.

REGULAR passenger air service will be established soon between Dallas and Los Angeles by the Western Air Express.

AIR enthusiasts of Corsicana, Texas, recently have organized the Corsicana Flying Club, Inc. Officers of the Club are: Ben Blackmon, president; Joe Jefferson, vice president; and Frank Lemon, secretary treasurer. A plane will be purchased and members of the club will begin training instruction under Pilot W. H. Stewart.

AMONG Texas cities and towns that have recently provided airports and suitable landing fields are: San Antonio, Houston, Beaumont, San Marcos, McLean, Sherman, Farwell, Friona, Sweetwater, Spur, Weatherford, Paris, and Big Spring.

THE coming municipal bond issue in Austin, Texas, includes an appropriation of $75,000 for the purchase and improvement of a municipal airport. At present there are two privately-operated commercial fields in that city. The Austin Air Service allows air mail planes to use their private field free of charge.

HOWARD WOODALL of Dallas was high man in the events of the air circus at Love Field recently. He piloted a Travel Air plane. Jack Lanier won the free-for-all race on the last day flying a Vought plane.

There were many other contestants in the various events among whom were: Capt. W. F. Long, of Southern Airways, Merle Brock, L. H. Lucken, F. L. Pierce, Byron Good, Bobby Duell, Fred Winberley, S. L. Underwood, C. E. Peeples, Herbert Kindred, Ross Arnold, Reg Robbins, Al Henley, Louis Derryberry, Shorty Raddick, acrobat and parachute jumper, and R. M. Dowley, balloonist. Linz Bros., the Arthur Everts Company, jewelers, and the Shaw Jewelry Company donated the cups.

GOOD & FOSTER of Love Field, Dallas, have purchased a Ryan Brougham and will carry passengers on cross-country and sight-seeing trips. The pilot will be Garza Wooten.

THE Second Division flying field at Ft. Sam Houston, San Antonio, has been named Dodd Field in honor of Lieut. Col. Townsend F. Dodd, a former commandant there and a pioneer army flying officer who lost his life in a plane accident near Philadelphia in 1919. Col. Dodd was in France on Gen. Pershing's staff and was chief of staff under Brig. Gen. William Mitchell.

(*Continued on next page*)

YES, ALL METAL
BUT THE TIRES



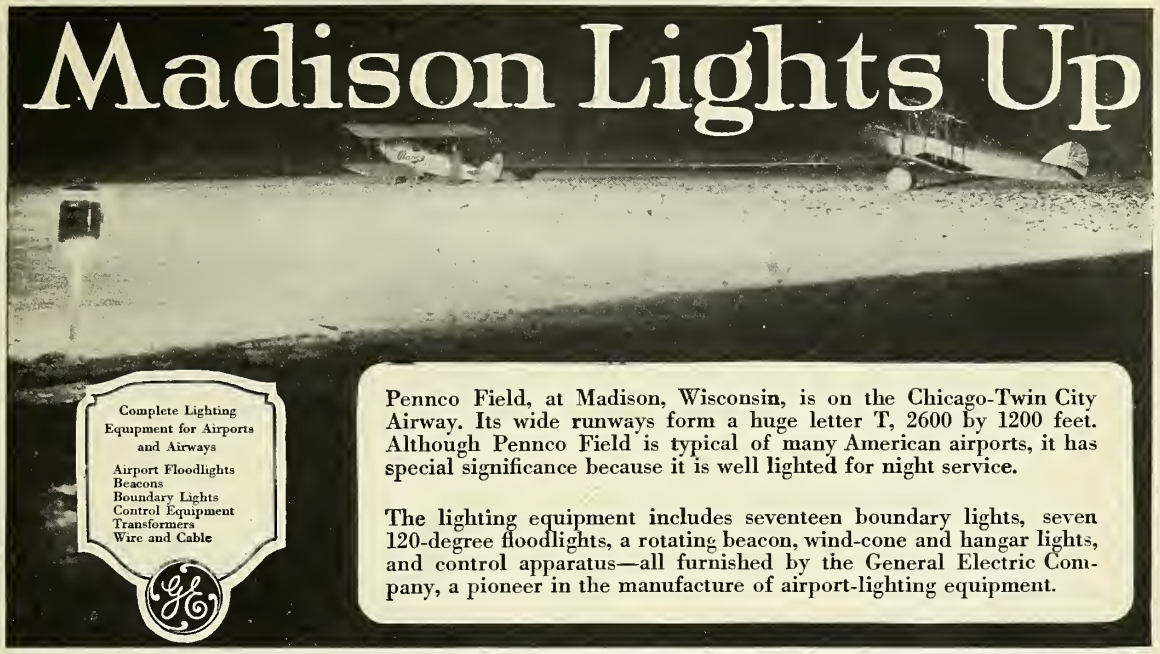
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Pennco Field, at Madison, Wisconsin, is on the Chicago-Twin City Airway. Its wide runways form a huge letter T, 2600 by 1200 feet. Although Pennco Field is typical of many American airports, it has special significance because it is well lighted for night service.

The lighting equipment includes seventeen boundary lights, seven 120-degree floodlights, a rotating beacon, wind-cone and hangar lights, and control apparatus—all furnished by the General Electric Company, a pioneer in the manufacture of airport-lighting equipment.

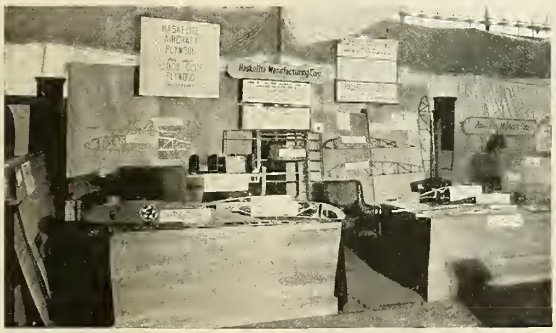
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Say you saw it in AERO DIGEST

(Texas Air News continued)

MAJOR JOSEF NOYES, commander of the 366th Observation Squadron of the reserves in Dallas, has been made the new national commander of the Aviation Cadets of America, succeeding Col. W. E. Easterwood, jr., who resigned recently.

THE Lions' Club of Fort Stockton has raised funds for the building of an airport in that city. Work of improving the field will be in charge of Rohea Baumgartner, a flier from Illinois. Hangars are to be built and the field improved.

A SIGN has been built on the roof of the Hussmann Hotel in El Paso to aid night flying. It is 80 feet long, 42 feet high, has 940 electric lamps in it and can be seen at a distance of nearly 50 miles.

THE airways division of the U. S. Department of Commerce will establish a second radio sending station at Love Field in Dallas. The Army already has a station there which directs the movements of army planes through here. The new station will broadcast weather reports and general service information for air mail and commercial fliers.

M. P. Exline, jr., of Dallas has been made manager of the National Air Transport flying service in Dallas, succeeding E. R. Bartosek, who goes to Chicago with the company. Herbert Kindred is chief pilot of the new service; C. T. Peeples, air mail pilot, assistant.

OKLAHOMA AIR NEWS

By Ernest W. Fair

THE Oklahoma State Air Tour has been completed, having started at Oklahoma City, May 14th with twenty-five ships entered. It was promoted by the Oklahoma State Chamber of Commerce for the purpose of boosting air-mindedness and to encourage airport building.

Cities visited on the tour were: Oklahoma City, El Reno, Guthrie, Ponca City, Enid, Altus, Chickasha, Norman, Duncan, Ardmore, Durant, Wewoka, Holdenville, Bristow, Okmulgee, Miami and Bartlesville.

Speakers of the tour were: P. C. Cramer, Department of Commerce, C. C. Roberts, Ralph H. Berry, Jack Hayes, H. C. Martin, M. H. Kotzehue, Glenn Condon, N. R. Graham, Frank Matchett, L. S. Reagan, Capt. Frank Hawks, J. W. Collier, George Ade Davis, and C. R. Braun.

AIR MAIL week was put over throughout the state by proclamation of Governor Henry S. Johnson. All cities of the state joined in observance of aviation week in the state.

W. C. BROWN and C. C. Herndon of Tulsa have left for Europe where they plan to study aircraft and airport conditions. Brown is connected with the Spartan Aircraft Co. of Tulsa.

FIFTY business men of Mangum recently bought an 80-acre tract on which they are going to build an air field. A large hangar will be built and the airport will be lighted with beacons. A service station for gas and oils will also be installed.

Poteau is making plans for a landing field.

Bristow opened its new airport May 25th. On the opening day gasoline was given all ships by the Transcontinental Oil Company.

Guthrie held a big celebration for its airport opening May 14th on the arrival of the state air tour. The reception committee was composed of Sam Gardner, J. J. Hidreth, W. R. Welch, A. W. Deane and F. M. Desels.

Dr. F. M. Adams of Vinita has offered that city the grounds for an airport if the city will build the necessary facilities upon it and take care of it. F. A. Darst of the Public Service Co. has offered to furnish all the electricity for night lighting that the airport would need. More of this sort of thing and the nation would be truly air-minded!

ORDERS have been issued that no stunting is to be done over the airport of Ponca City.

THE Oklahoma City *News* is carrying a weather note for fliers on the front page of its paper each day. Arrival and departures at the local airport are also carried.

THE Aero Photo Company of Oklahoma City handled all of the pictures of the Oklahoma Air Tour. Clint Johnson and Bill Bleakley of Oklahoma City recently organized this company.

THE Spartan Aircraft Co. of Tulsa is swinging into rapid production of their ship, the Spartan biplane.



The 4-Place Cessna Cantilever Cabin Monoplane

Equipped with

Wright Whirlwind Motor — 10-Cylinder Converted Anzani

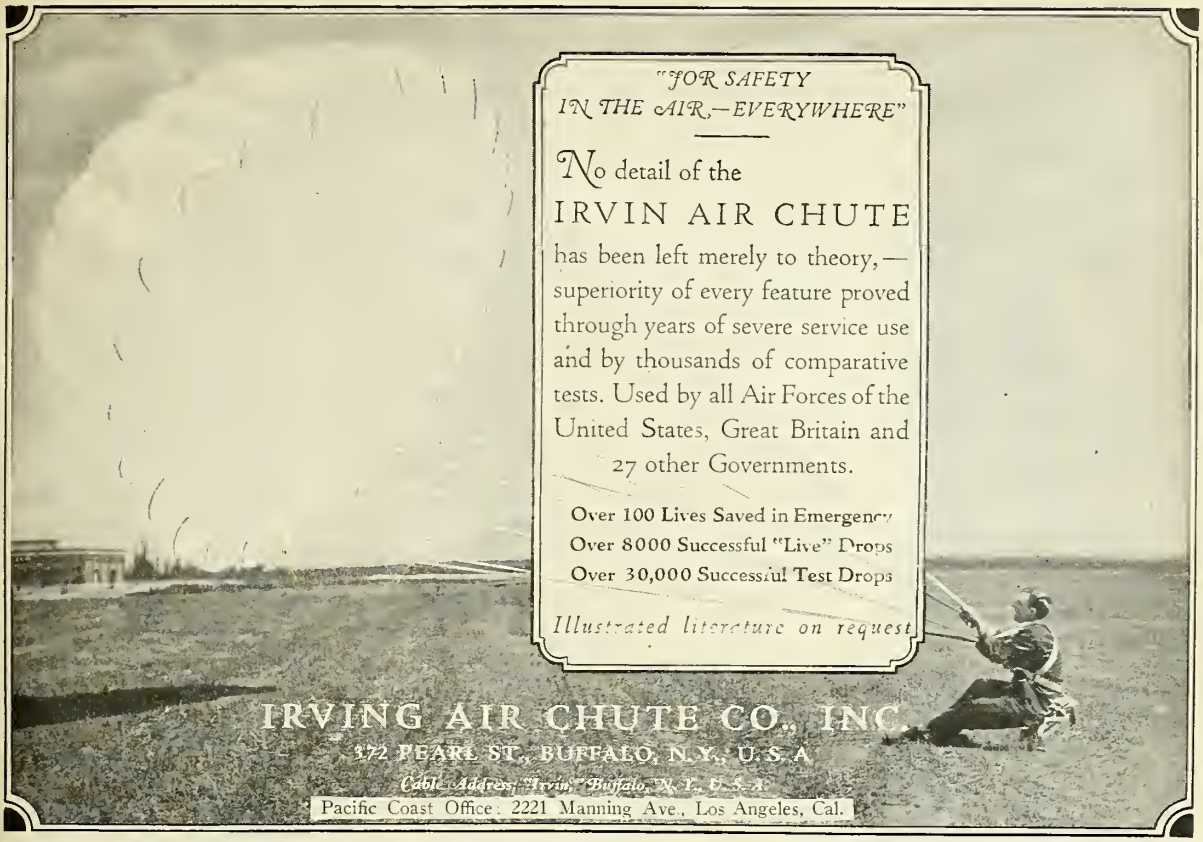
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Think of what this speed and comfort mean to a commuting business man, who, by the use of it, can save time and avoid fatigue. Think of a travelling salesman who can triple his territory, and who can improve his sales by avoiding fatigue and by keeping fresh and active.

For the commercial operator the riding comfort of his machine attracts passengers. They feel safer in flying over water. They see the great expanses of water suitable for landing, and in a seaplane they are saved the hair raising sensation of sideslipping into a small field, barely missing the tree tops.

With a seaplane you can get to the people. You can operate from seashore hotels, bathing beaches and amusement parks, where there are crowds eager for amusement. Compare this with the trouble and expense of luring people to a distant flying field, and you will realize the potential possibilities of seaplane operation.

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"THE DRIFT INDICATOR"

A TREMENDOUS amount of interest has been aroused by the demonstrations of the De Havilland Moth equipped with Handley Page wing slots. James B. Taylor, an officer of Air Associates, Inc., has taken up a great number of pilots recently and shown them the effect of the slots.

Almost as soon as the little plane was set up at Curtiss Field, Mr. Grover Loening, well known aircraft designer and builder, bought it for his own use.

As a result of the demonstrations, a number of orders have been taken by Air Associates for Moths and in addition they are importing ten Avians. The Avians will also be equipped with wing slots and are similar to the Moth in many respects having the same Cirrus Mark II engine and is about the same size.

With the motor shut off in the Moth the stick can be pulled way back and the plane can be kept in a lateral position. It settles quickly and the nose gradually drops into an easy dive. Aileron control is never lost. With power on the motor will fly along in an extremely stalled position and will not fall off on either wing.

There is a general misconception that the Moth with slotted wings will not spin. It spins easily and rapidly and comes out of it very quickly.

In addition to his own use of the plane, Mr. Loening has placed the Moth at the disposal of the Guggenheim Fund whose pilots during the last week of May carried on extensive preliminary tests according to the regulations laid down by the Guggenheim Safety Competition.

A STEP of far reaching importance to the aeronautical industry throughout the world is seen in the announcement made by Charles L. Lawrance, president of the Wright Aeronautical Corporation, that contracts have been signed which grant to three large foreign corporations and to one foreign government the right to manufacture and sell the famous "Whirlwind" engines.

Contracts were made with the following:

Skoda, Ltd. of Pilsen, Czechoslovakia, for manufacturing Wright engines. This company will supply a large part of Central Europe, including the Balkan States and Finland.

The Societe Francaise Hispano-Suiza of Paris, France, for the manufacturing and sales rights. This company will supply the demands of Norway, Denmark, Sweden, France, Spain, Portugal, Greece, Belgium, Holland, Switzerland, Turkey and their colonies and dependencies.

The Government of Poland showed such interest in the Wright "Whirlwind" and other Wright products that a separate contract was granted them to take care of the demands of that country.

Canadian Wright, Ltd. of Montreal was formed to take over the manufacturing and sales rights for these engines. Among those on the Board of Directors of this company are James Richardson, wheat magnate of Winnipeg and owner of the Western Canada Airways; James Playfair, retired capitalist of Montreal and owner of the Patricia Airways; Frank Ross, shipbuilder and steel operator of Montreal; George Barr, managing director of the Canadian Vickers, Ltd.; H. H. German of Montreal, manager of the Canadian Vickers, Ltd.; and J. Arthur Mathewson, Montreal barrister. The Canadian Wright, Ltd. will assemble, manufacture and sell Wright engines in Canada, Newfoundland and Australia and at the same time will take care of business originating in other sections of the British Empire.

Bits of news picked up here and there

SIGNIFICANT of the growing importance of the airplane industry as a potential market for replacement parts, was the leading rôle played by parts makers at the recent All-American Airplane show in Detroit, according to E. P. Chalfant, executive vice president of the National Standard Parts Association.

No less than eight members of the N.S.P.A. were represented at the big airplane exhibit, together with other replacement manufacturers.

David W. Rodger, chairman of the N.S.P.A.'s Aeronautical Committee, commented: "The show was a revelation. In addition to opening the public's eyes to the tremendous development recently in aviation equipment by displaying luxurious and commodious planes that are the last word in comfort and convenience, the show had an additional significance in bringing home the fact that the era of replacement in aviation is one of the present and not of the future.

"At the present rate that planes are being made and sold, and which notwithstanding its rapid increase is as yet only a slight indication of the tremendous volume that is certain to be reached in the years to come, the replacement of parts for America's airplanes constitutes a market of which replacement parts manufacturers must take immediate heed."

THERE were 58 planes in the Detroit All-American Aircraft Show other than exhibit and school planes. Four of these 58 planes were all metal planes; 50 of the 54 remaining planes were equipped with Haskelite. In other words, the Haskelite representation of the exhibit was 92.6 per cent.



G. W. Vaughan, vice-president of the Wright Aeronautical Corporation

ONE of the superior features to be found in American aviation fields will be landing strips, roadways and aprons in front of hangars, that are paved with asphalt. Owing to the fact that airplanes are now equipped with brakes on the landing gear, it will soon be possible for planes to land in very limited spaces, provided the areas are paved.

In Europe paved aprons in front of hangars have been in use for some time and in certain of the European airports, like the Luft Hansa's main airport at Berlin, Germany, circular paved tracks running around the field in front of the hangars on the four sides thereof are proposed to facilitate the removal of planes from one hangar to another.

Asphalt paving for airport landing strips, aprons and roadways, can be "feather-edged," thus enabling planes to cross them at right angles without fear of damage. Asphalt paved strips are planned for Selfridge Field, Barren Island municipal airport at Jamaica Bay, Long Island, New York, and numerous other military, naval and commercial fields contemplated or actually under construction. The Barren Island port will be ready for use this summer. At this port the runways or landing strips, will be of asphalt, but the remainder of the fields will be sown to beach grass until a heavy sod can be raised. A paved seaplane landing and take-off strip will be constructed to run into Jamaica Bay.

AIR TOURS of European countries are attracting a great deal of attention this summer.

Mercury Tours has announced an air cruise of Europe which starts from New York on the Cunarder *Tuscania*, July 14th. The tour will extend over a period of 50 days during which time six countries will be visited by air. The planes will be those of big European air lines.

Another air cruise will be conducted by the American Aviation Tour of Europe 1928 Committee. It is scheduled for September 8-29 of this year. Under the auspices of the North German Lloyd, the German Luft Hansa, the Imperial Airways, Ltd., the Air Union and Farman, of Paris, and the Kon. Luchtvaart My., of Amsterdam passengers will fly 2,700 miles in the latest type of transport planes over Germany, Austria, Switzerland, France, Holland and England. Transatlantic passage is to be made both ways on the Lloyd liner *Columbus*.

Special features of the trip will be attendance at the International Aeronautical Exhibition in Berlin; inspection of the airplane works of Citroen in France; Fokker in Holland; Focke-Wulf, Junker, Raab Katzenstein, Rumpler, Rohrbach, Daimler, Dornier and Zeppelin in Germany; and other points of airplane interest in England and on the continent.

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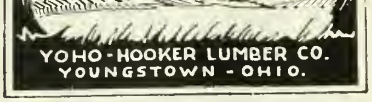
CORDS: Shock Absorber, Instrument Mounting, Parachute Pack Opening, Balloon Valve, Glider Sling.
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24 ft. span, 18 ft. over-all length. Fuselage constructed of steel tube, joints made with steel fittings or welded. Powered with Lawrence 2 cylinder or other similar motor.
Complete set of blue-prints and an 8-page booklet explaining all the short-cuts and every move made in the building of this ship. Price, $7.50
We also have a dope-sheet, giving proper proportions of wing, tail group, etc., for any size ship, and explaining aeronautical fundamentals. Price, 50c.
We build tail groups, landing gears, fuselages, wings, ribs, etc., to your specifications.

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Sales Office: 209 Bancroft Bldg. San Diego, Calif.
Factory: 4989 Vista Place San Diego, Calif.

OKLAHOMA AIR TOUR

By Merle F. Blakely

AFTER a week of cruising on Oklahoma's untried airways with most of the flying time spent in thunder showers or dodging rainstorms, 25 ships of varying models settled on McIntyre Airport at Tulsa, May 18 as the final stop on Oklahoma's first state air tour.

Everyone of the 20 craft which took off from Oklahoma City May 14 were at the finish and five additional planes had joined the fleet. Eighteen cities were visited by the flying pioneers and the 80 odd passengers and pilots were acclaimed by crowds, aggregating more than 73,000 persons at the different flying fields.

Leading the air-minded Oklahomans was Ralph H. Berry of Tulsa, tour manager and general chairman, whose efforts largely were responsible for the successful termination of the Oklahoma flight. M. H. Kotzebue of Tulsa, a leading figure in southwest air circles, was tour commander.

The main purpose of the tour was to sell Oklahoma's citizenry on the value and future of commercial aviation—and the rain, instead of hampering the tourists, aided them in proving the security and reliability of modern aviation. The air fleet completed its five-day journey without a forced landing or major mishap in spite of poor flying conditions and maintained schedule throughout the tour.

Cities visited in their order were: Oklahoma City, Elreno, Guthrie, Ponca City, Blackwell, Enid, Altus, Chickasha, Lawton, Duncan, Norman, Ardmore, Durant, Holdenville, Okmulgee, Miami, Bartlesville, and Tulsa.

Governor Henry S. Johnston of Oklahoma bade the trippers "bon voyage" in a ceremony at the Oklahoma City municipal airport at the take-off. Before the celebration was completed, Chairman Berry and his pilot, William Collier, chief instructor at McIntyre airport, hopped off in their Waco-10 to Elreno to check the condition of the field and make last minute preparations. Throughout the week, the Berry ship kept half an hour in advance of the fleet. Billy Burke of Okmulgee was flight leader in his Stearman Whirlwind.

At Oklahoma City, each pilot and passenger was supplied with a tour privilege card. On the back of this ticket, which entitled the holder to courtesies at all stops, was a list of rules and regulations governing the state excursion. Pilots were furnished with a pocket booklet which contained blue prints of every field to be visited with ground markings and obstructions listed. In every city, two guards were assigned to the planes to prevent damage. At midday stops, programs were given at the fields and luncheon was served. Over night stops were made in four cities and in each the tourists were banqueted.

Gasoline and oils used by the tour ships were furnished by the Skelly Oil Company of Tulsa.

Ships which made the Oklahoma Tour included the Texas Company's Ford trimotored monoplane piloted by Frank Hawks, five Eaglerocks, two Douglas Army planes, three Travel Airs, six Wacos, two Spartans, one Stinson Detroiter, one Menasco Eaglerock, one Coffman, one Lockheed, one Swallow, one American Eagle, one Ryan Whirlwind, one Stearman. The Army planes were with the fleet only two days, joining them at Lawton.

The pilots on the tour were: H. W. Parker, Ted Moffit, Bob Tarbutton, R. C. Schreader, Burrell Tibbs, Roy French, Frank Hawks, Lt. C. W. Cousland, Lt. J. R. Reed, Maurice Marr, Fred Whitaker, Charles Parker, W. L. Dugan, W. S. Collier, J. W. Welborn, William A. Burke, Sam Coffman, Al. Henley, C. R. Beindorf, J. G. Haizlip, Toni Parks and Harold Kindred.

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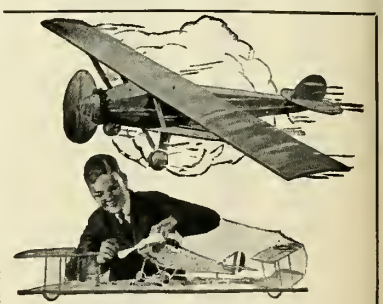
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Built of light steel and stucco, the exposition building will measure 400 by 500 feet and will contain 200,000 feet of exhibition space in one huge room. The building will be of Spanish and Moorish architectural motif and will be the most beautiful exhibition structure ever used for aeronautical display.

THREE landing fields, totaling 2,200 feet wide and one mile long, will be located alongside of the exposition building. Airplane manufacturers may fly their planes to the doors of the building, thus saving the cost of dismantling, freighting and reassembling both ways. The landing fields are available also for demonstration purposes. This is the first time this feature has ever been offered to exhibitors.

THE leaders of the aircraft industry are making exhibition space reservations by telegraph and air mail. If you haven't already done so, get your application in today. This exposition has been sanctioned by the United States Aeronautical Chamber of Commerce and will be one of the biggest aircraft shows of 1928.

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Telegraph or air mail Cliff Henderson, Managing Director,

National Air Races and Aeronautical Exposition

Ambassador Hotel — Los Angeles, Cal.

MIAMI AIR NEWS

By Johnson Wright

THE 54th Street Airport has been a very popular one this past winter, having been visited and used by practically every type of ship made in America.

Hialeah Airways, Travel Air distributors for the state of Florida, operate the field. The Travel Air agency has recently been secured by them. Two new OX5 Travel Airs and an Eaglerock are now being used for the school and passenger carrying.

S. A. Belcher is the owner; H. L. Turner, manager; and William S. Kay, pilots of Hialeah Airways.

THE Rogers Air Lines' docks in Miami have been used as a base for Gar Wood's Wasp-engined Fairchild seaplane, "Kinjockety". During the summer Mr. Wood will use the "Kinjockety" to commute between Detroit and his summer home. Pilot George Cobb has been instructing Mr. Wood in piloting this ship.

The Greater Miami Airport Association recently elected Mr. Wood an honorary member.

KENTUCKY AIR NEWS

THE Cardinal Flyers, Inc., was organized in April at Louisville. The following officers were elected: L. L. Miles, president; Saujders Joes, vice president; and Houston Quin, secretary-treasurer. Robert Gast, formerly of the Aeronautics Branch, Department of Commerce, is general manager of the company.

The Cardinal Flyers operate off of Bowman Field, which is the municipal airport of Louisville. Besides being large and well drained, the field is equipped with a government radio station and meteorological bureau. The company has the Waco distributorship for western Kentucky and Tennessee. In addition to passenger carrying, photography, cross-country trips, this new company is starting a flying school.

LIBERTY ENGINES STILL IN PRODUCTION

JOHNSON MOTOR PRODUCTS, INC., is still producing Liberty engines. Although the castings and forgings originated in the Ford plant, the engines are brand new.

BOYCE MOTO METER SALES REPORTED

HENRY G. BOYNTON, manager of aviation sales of the Moto Meter Company, reports orders received from the Fairchild Aviation Company of 100 model "C" Boyce Moto Meters. He also reports an order of 24 of the same type from the Stout Metal Airplane Company division of the Ford Motor Company and 100 to the Pioneer Instrument Co.

BEDFORD AIRPORT

A GROUP of Bedford and Bloomington business men incorporated during the late fall of '27 under the name of Indiana Airlines, Inc., to establish a modern airport in southern Indiana. A 200-acre tract was purchased on the Dixie Highway approximately 6 miles south of Bedford and runways are now under construction which will bring the field under "AAA" Department of Commerce rating.

The personnel consists of Ellis Fish of Bedford, president and general manager; Lt. P. B. Payne, recently of Wilbur Wright Field, chief pilot; and H. Murray Barnes, alternate pilot and in charge of ground crew. Wacos are being used for instruction and passenger work.

WOMAN HEADS AVIATION SCHOOL

MISS OLIVE WILLIAMS is one of the few women in the world at the head of an aviation school. At the Aviation Engineering School at 225-27 West 57 street at Broadway, N. Y. C., of which she is president, there are 150 men and 30 women studying navigation, meteorology, aerodynamics, and the construction and maintenance of airplanes and engines.

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FOREIGN AERONAUTICAL NEWS IN BRIEF

Compiled from the foreign aeronautical press, the Transportation Division, Bureau of Foreign and Domestic Commerce and our special correspondents

ENGLAND

THE Prince of Wales has had placed at his disposal an R. A. F. Bristol Fighter fitted with the Handley-Page slotted wing device. The ship will be available at Northholt, Middlesex and will be piloted by any competent man on duty.

AIR mail, passenger and freight service will be inaugurated between Durham and Johannesburg by the African Airways, Ltd., during June or July. The service will operate daily each way, except Sunday.

SIR CHARLES WAKEFIELD, has presented to the Society of Model Aeronautical Engineers, a handsome silver cup, as an international trophy, to be competed for annually, under rules drawn up by this society.

It is proposed to hold the first international competition at Hendon, London, September 22nd.

Air Vice-Marshall Sir W. Sefton Brancker is president of the Society; W. E. Evans, treasurer; S. A. F. Crouch, secretary; Address of secretary: 23 Mayfair Ave., Ilford, Essex. A copy of the rules of this competition may be obtained from the secretary.

ONE of the latest type torpedo planes to be constructed for the British Air Ministry, the Blackburn-Napier "Ripon," is designed by the Blackburn Aeroplane Co., and is fitted with a 500 h.p. Napier aero engine.

The "Ripon" carries a crew of two, the rear cockpit being occupied by an observer gunner armed with a movable machine gun, thus rendering this aircraft capable of defense and independent of escort. The machine carries a torpedo load of 1,500 pounds, although, should it be desired, it can be used as a bombing machine apart from a torpedo plane. It has a particularly high performance, is economical to maintain, has a quick take off and climb, a slow landing speed and excellent acceleration. In recent tests over the Humber River, a torpedo weighing nearly a ton was dropped at an appointed mark.



Koolhoven F. K. 31 fighters, Bristol Jupiter engines, in the French Air Service.

FRANCE

UNDER the auspices of the Paris N.A.A. Chapter and the Aero Club of France, the American Ambassador, Hon. Myron T. Herrick, presented the Nungesser-Coli-Lindbergh monument to France at the unveiling, in the Aerodrome of Le Bourget, on May 8th. The American monument was given to France by Mr. Robert Jackson of Concord, New Hampshire in honor of Nungesser, Coli and Lindbergh, to commemorate the first transatlantic flight between the United States and France in 1927.

M. JACQUES SCHNEIDER, universally known as the sponsor of the famous international seaplane races, died at Beaulieu, on May 1. Early in 1913, the French manufacturer offered the Schneider Trophy for all-round seaworthiness in an international contest. This contest has developed into one of speed in which the fastest aircraft in the world are entered.

THE Aero Club of France has awarded its medal for the best technical work on aeronautical engineering appearing in 1927 to Edward P. Warner, Assistant Secretary of the Navy for Aeronautics, for his "Airplane Design-Aerodynamics."

ITALY

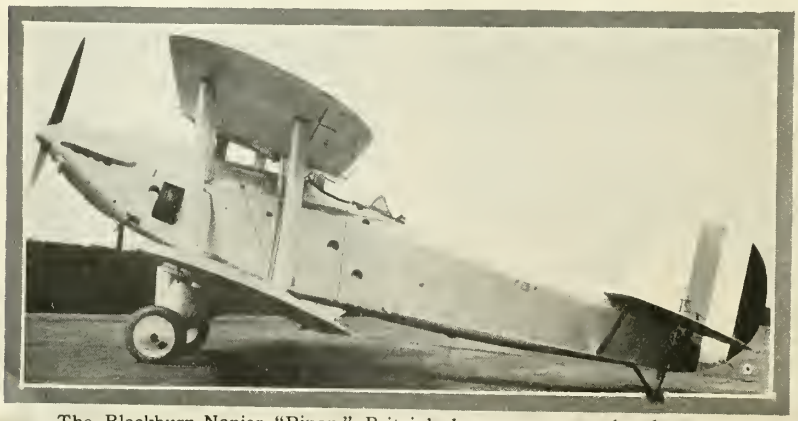
WITH facilities to receive both land and sea planes, the Littorio Aerodrome, one of the most modern airports in Europe, was opened at Rome on April 21, by Signor Mussolini.

"ITALIA" CIRCLES OVER NORTH POLE

THE Italian expedition which started from Milan, April 15, under the able command of General Umberto Nobile, fulfilled its plans when on May 24 the dirigible *Italia* circled over the North Polar environs for two hours. Over each lap of its journey the dirigible satisfactorily surmounted all difficulties it met although its progress at times was seriously impeded by thick fogs, heavy snow and high winds.

After landing at Kings Bay, Spitzbergen, on May 3, they delayed several days to make minor repairs. As General Nobile had planned the *Italia* made three trips over the North Pole regions from its base at Kings Bay where the supply ship, the Citta di Milano, was stationed. The first, a reconnoitering trip, was attempted on May 11, but the dirigible returned after eight hours because the thick fog made any attempt at observation futile. The second, was made to Lenin land, returning to Kings Bay on May 18 after cruising for a period of 68 hours without seeing any new land. The third, which had the North Pole as its goal, was attempted May 23 and after flying about 750 miles from its base General Nobile, for the second time circled the top of the world. He and his crew reached the North Pole, made their observations, dropped the cross entrusted to their care and then headed south for Spitzbergen.

The last message received from the dirigible at headquarters, Kings Bay, Spitzbergen, came at 9 a. m., Greenwich time, on May 25. It reported the *Italia* on an easterly course and the belief of her navigators that the craft at 3 o'clock that morning had been about 230 miles north of Kings Bay. At the time AERO DIGEST went to press no further word had been received as to the whereabouts of the *Italia*.



The Blackburn-Napier "Ripon," Britain's latest type torpedo plane

ANNOUNCEMENT

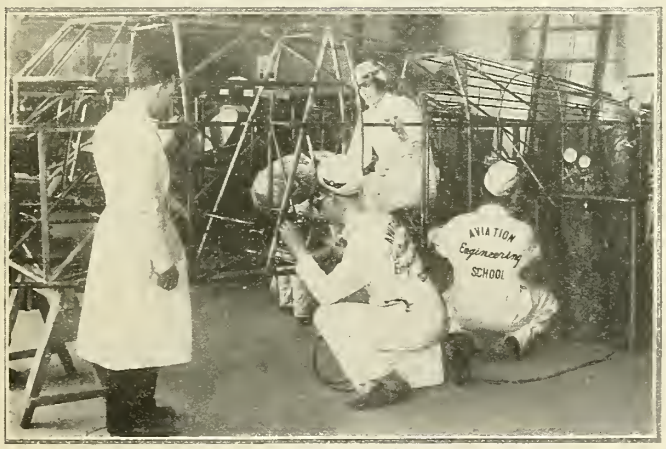
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To those busy men and women who are anxious to learn aviation, but find time very short — we suggest that you investigate our SPECIAL SHORT PERIOD COURSES, scheduled for the summer months, from June to August 31st.

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CANADA

Ontario Air News

By James Montagnes

THE Ontario Provincial Air Force, a branch of the Ontario Department of Lands and Forests, began their season's work the beginning of May. The fleet of 22 seaplanes, 12 H.S.2L flying boats and 10 De Havilland Moth Scout planes, is used for forest fire prevention, as well as other governmental work in the north country, including mapping, photography, surveys, and police work.

THE Toronto Flying Club opened its quarters at Leaside the middle of April. A Moth Scout plane was presented to the club by Sir Charles Wakefield of England. One hundred and thirty members of the Club have signified their willingness to learn to fly, and Canter Guest, the club's instructor, is kept busy daily putting the would be fliers through their paces.

AIR MAIL is now leaving Toronto several times a week for Rimouski, Que., where it is transferred to Atlantic liners bound for England. Mail arriving on these liners is taken off at Rimouski, and flown to Montreal, thence to Toronto. The Canadian Pacific Express have installed an air express service in conjunction with the mail service, the rates being the same as those of the American Express. Pilot J. H. St. Martin flies the Fairchild plane with the mail and express out of Toronto. Canadian Airways, Ltd., operate the service. They have also made trial trips on a passenger service from Toronto to Montreal. The trip was made in a little over three hours, and it is expected that the fare will be about $35.

JACK HAMMELL, one of the leading Canadian prospectors, who recently formed the Northern Aerial Mineral Exploration, Ltd., flew his first ship to Toronto a few days ago from New York. Captain Harry "Doc" Oaks, formerly of Western Canada Airways and now with Jack Hammell, piloted the Fairchild seaplane from New York to Montreal and to Toronto. The ship is now on its way to the Arctic Circle, where it will carry a number of prospectors.

News From Canada

By C. P. C. Dowsman

A FLYING CLUB was organized recently at Kingston, Ontario. The following officers were elected: Hon. president, Mayor W. H. Craig; president, Col. E. J. C. Schmidlin; vice president, W. Leach; 2nd vice president, Columbus Hanley; 3rd vice president, Major Stetham; 4th vice president, Prof. W. P. Wilgar; secretary-treasurer, Hew Duff. Executive committee—W. Herrington, A. B. Gash, Major Cartmer, Prof. M. Arkley, Arthur Holder, J. F. Sowards, R. F. Vair, Major J. F. Alderson and T. G. Bishop.

AERIAL SURVEYS of the north country, up at the top of Alberta, will be commenced this summer. A programme covering three or four years will be undertaken, beginning this season in the vicinity of Lake Athabaska, coming south along the riverways to McMurray.

THE Department of National Defence will hold civil service competitions for the positions of Air Harbor Manager, at the St. Hubert Aerodrome, near Montreal, and Inspectors, Civil Aviation, at Ottawa.

The air harbor manager will have charge, under the superintendent of airways, of a public licensed air harbor, including the flying field or water surface, hangars, slipways, workshops, etc., at St. Hubert; will collect all operating fees; supervise aerial traffic; and cooperate with customs officials at the port. Qualifications for the post include, high school graduation, five years' experience in aviation, a license as commercial pilot and air engineer, wide knowledge of the different types of aircraft, experience in the layout and construction of aerodromes and seaplane bases, a thorough knowledge of air regulations, etc.

For the posts of Inspectors, Civil Aviation, applicants must have education equivalent to a university graduation, several years' aviation experience, and a wide knowledge of aircraft of different types. They must also be versed in meteorology as it effects flight, and be able to conduct theoretical and practical examinations, as well as pass on aircraft construction and assembling.

IN connection with the St. Huhert airport at Montreal, the Canadian Airways, Ltd., have established an aircraft factory at Pointe aux Tremhles. A two-story factory situated about one mile east of the town has been leased and this will be used for both the repairing and building of aircraft.

MONTREAL'S first annual aviation exhibition will be held from July 8 to 15. It is being arranged by the Montreal Light Aeroplane Club.

J. A. Wilson, controller of civil aviation, has intimated that the free use of St. Huhert Airdrome will be made available for all aircraft visiting Montreal during the exhibition. He further stated that any foreign machine, especially from the United States, will be relieved of all customs formalities apart from reporting to the customs officer in charge.

Canadian Vickers, Ltd., have agreed to provide free mooring facilities in their harbor at Maisonneuve for all seaplanes and flying boats coming to Montreal for the show. The Reid Aircraft Company, Ltd., has provided the free use of their airpark at Cartierville.

A NEW booklet is under preparation by the Montreal Tourist and Convention Bureau, Inc., entitled "Airports at the Royal City, Montreal," which will give complete information as to the various airports in the vicinity of Montreal. Maps will also be prepared, showing directions and mileages covering routes between important cities in Canada and the United States, for the convenience of those travelling by air routes.

CAP DE LA MADELEINE and Three Rivers on the north shore of the St. Lawrence, midway between Montreal and Quebec, now have an airdrome, which, on its completion, within a month, should prove a distinct credit to cities of far greater population.

The new airdrome extends 2,500 feet by 1,200 feet on the east side of the St. Maurice River, south of the Canadian Pacific track and east of the Three-Rivers-Grand 'Mere highway. It is immediately adjacent to Piles Junction and near the center of Three Rivers.

Western Canada News

By James McCook

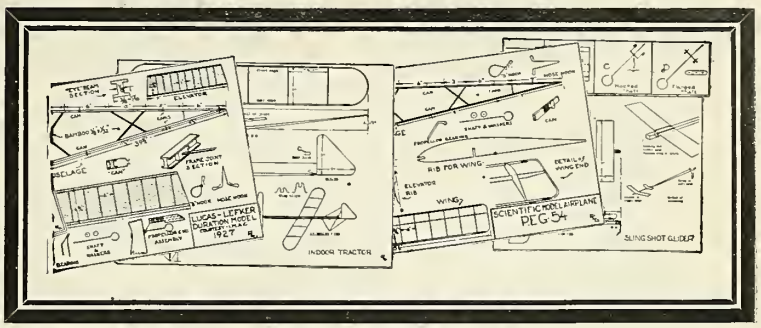
WESTERN CANADA AIRWAYS, LTD. with headquarters at Winnipeg has purchased Pacific Airways, Ltd. Establishment of an airplane service between Winnipeg and Vancouver, a distance of nearly 1,500 miles, is said to be the ultimate object of the deal between the two companies. Plans for the Winnipeg-Vancouver service call for a 20-hour trip with a stop at Calgary for refuelling. It is expected that the Winnipeg-Calgary branch will be put in operation this year and the Calgary-Vancouver section, which is directly over some of the highest peaks in the Canadian Rockies, next spring. Major D. R. MacLaren, D.S.O., M.C., head of Pacific Airways, Ltd., will act as superintendent of the new company on the coast.

Plans for a triangle passenger and express service between Vancouver, Victoria and Seattle, Wash., with one round trip daily, have been made by the new firm, which will also conduct the fisheries patrol for the Dominion Government in British Columbia and do commercial flying of all kinds. A number of new planes, including several Boeing seaplanes and one or two Fokker Super-Universals fitted with floats, will be employed in British Columbia.

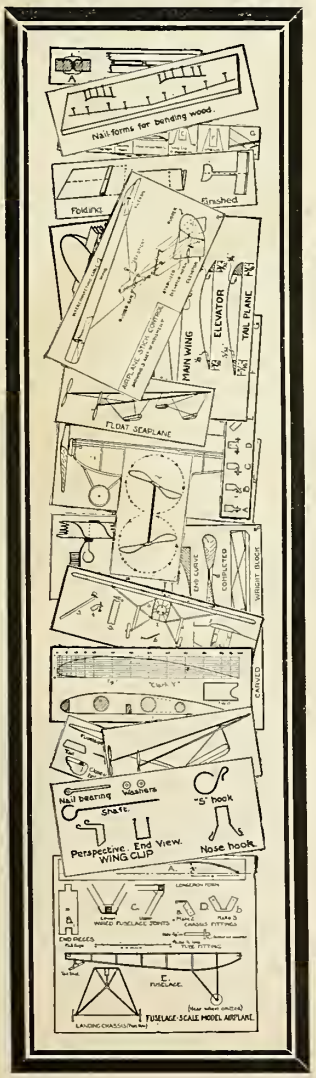


All-metal Beardmore "Inflexible," with three Rolls-Royce "Condors," 650 h. p. each. Wing span, 150 ft., weight, 15 tons





Note: All the illustrations reproduced on this page are greatly reduced in size.



Just Off the Press!

Model Aircraft are no longer merely toys. They have a definite and increasingly important place in the study of practical aeronautical engineering and design. Thousands of men and boys throughout the country are building and flying models; their number is growing with amazing rapidity. New records are constantly being set; flights of more than a mile and lasting ten minutes or longer are by no means uncommon.

Every man or boy who builds aircraft models will find information he has long wanted in Paul E. Garber's new book **Building and Flying Model Aircraft.**

Shows How to Build Any Model

One of the most valuable features of this book is the way in which model construction is treated in successive stages so that each step not only a new design but also a new method of construction is explained; when the book has been followed to its close the reader will be able to construct models of his own design in the most appropriate manner.

Full instructions for building fifteen types of model aircraft are supplied in this new book. It contains 198 illustrations, including photographs and detailed working drawings so that every step in the construction of models is made clear and easy to follow. Among the aircraft described are modelsfor indoorand outdoor flying, including tractor and pusher airplanes and seaplanes, scale models for exhibition purposes, gliders, and balloons; included also are accessories such as winders, carrying boxes, repair kits, etc. This book also tells how to make propeller and other wooden parts, metal fittings, compressed air engines, the best way to attach paper and cloth wing coverings, gives complete lists of all the materials and tools needed, and in every other way anticipates and asnwers the questions that puzzle model builders.

The Official Book

Building and Flying Model Aircraft is the official book of the Playground and Recreation Association of America which is conducting the National playground Miniature Aircraft Tournament. This Tournament is sponsored by shcu leaders in aviation as Orville Wright, Chairman of the Tournament Committee; Colonel Lindbergh, Associate Chairman; Commander Byrd; Henry Ford; Porter Adams; Harry Guggenheim; Clifford B. Harmon; and the Assistant Secretaries for Aeronautics: Edward P. Warner, of the Navy; F. Trubee Davison, of the Army; and William P. MacCracken, Jr., of the Department of Commerce.

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Olive Patton Zeigleur, Birmingham, Alabama, won the prize for June.

Little Alice, aged three, after she had been tucked into bed was afraid of the dark. "There's some One who always takes care of little children, dear," her mother assured her. But Alice looked puzzled and her mother continued: "Don't you remember . . . some One up in the sky?" Alice smiled back. "Oh, yes, 'course I do now—Lindbergh!"

Wonder What the Spirit of St. Louis Thinks About Now!

By Briggs

I never dreamed I'd come to this!! This is my reward!! Buried alive! Doomed to eternal—What!? Once I was everything—now I am nothing—just another museum piece.

* * *

Take off that name!! I am no longer "The Spirit of St. Louis." This is not St. Louis Spirit. I'll rot and rust and fall apart in a glass cage.

* * *

Lindy old pal, how could you do it!! Yes, yes I know you had lumps in your throat and a tear in your eye—But—here I am—while you go on—and on—and on.

* * *

Supposing they put *you* in here to be stared at the rest of your life while I continued flying. Would you stand for it!? Not you old pal—I know you.

* * *

We did have such famous times together! And you'll never have another as faithful and trustworthy as I.

* * *

I am not jealous of your new loves, but do come and see me occasionally and let me have a look at you, kid. And please don't ever have another "We".—*Courtesy of the N. Y. Herald-Tribune.*

Waiting for the Aerial Express

"Hello, Ike."

"Morning, Wallie."

"Did th' 8:17 plane from Wichita get in yet?"

"Nope. She's behind time agin."

"How much?"

"Last reports had her runnin' 45 seconds late."

"That's the second time this week that plane has been way off schedule, ain't it?"

"Yep. 'Tain't doin' the company no good neither. I wouldn't be surprised if she was a full 50 seconds behind time before she finally pulled in."

* * *

"Imagine a big transportation system runnin' its airplanes almost a minute late! It's pretty terrible service."

"Sure is. Everybody's kickin'."

"There must be sumpin radically wrong somewhere. I had a cousin come in from Los Angeles last Tuesday on the monoplane due at 12:07 and it was nearly 12:08 before it pulled in. I miscalculated an got here four seconds ahead of time. The result was that I was kept waitin' aroun' for a minute and two seconds all told. It may not mean nuthin to the company, but I'm too busy a man to waste time like that."

* * *

"I don't blame you for squawkin', Wallie. You ain't the only one. Luke Meriwether's half sister got in on the Wild Goose Limited from Hollywood a week ago Friday and the darned plane was a minute and a half late arrivin'. Luke was here to meet her, and you know how he hates to be kept waitin' around for anybody. He nearly threw a fit. I understand he wrote a hot letter to the newspapers."

* * *

"What seems to be throwing the planes so far off schedule anyhow?"

"Well, the 4:10 from Mexico City was eleven seconds late due to a heavy squall over Pennsylvania. The 5:15 had to slow up on account of hittin' an eagle. And the 7:22 was slowed up about 30 seconds due to runnin' through 400 miles of fog."

"Well, there's no excuse for such delays. There's mismanagement somewhere."

"The worst delay we've had in months happened yesterday morning to the Coast to Coast Comet."

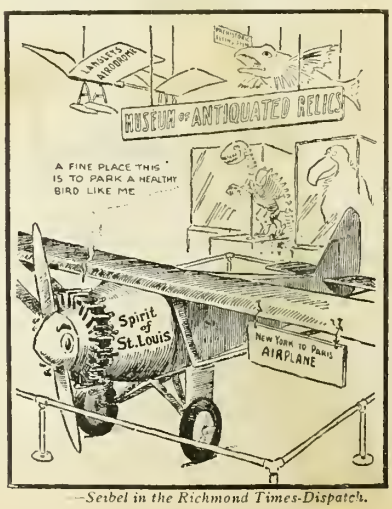
"Zat so?"

"Yes. It was a full five minutes late and the crew was suspended pendin' an investigation. You've heard the rumor, ain't you?"

"What was it?"

"Well, they say the conductor's hat blew off flying over Missouri and the engineer turned around over New Jersey and went back after it!"

—*H. I. Phillips in the New York Sun.*



—*Seibel in the Richmond Times-Dispatch.*

He, telling her all about the big air race: "I was in the lead for the first thousand miles. Everything was working fine. Suddenly the oil failed, and within two minutes my motor flew apart."

She meekly: "Which part, dearest?"

—*Delbert Hall.*

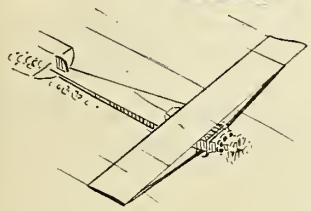
The well known dear old lady was at the field for her first flight. The "fan in front" had been "turned on" and she had just settled herself comfortably in the cockpit when approached by a field attendant with the form of release in favor of the operator in event of accident which used to be common at flying fields, for her to sign.

As she listened to the terms of the agreement as read to her by the field's "spieler" her fingers drummed a nervous tattoo on the cowling.

"My dear young man," the w.k.d.o.l. snapped petulantly as he finished, "I came out here to take a ride in an airplane, not to receive legal advice. Now begone!"

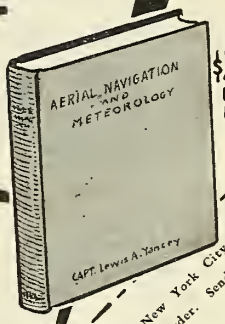
—*Kenneth D. Stern.*

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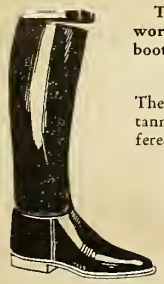
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These boots are made of a high quality leather, tanned by time-honored English methods. Offered as follows: C-2774—Men's tan willow calf: C-2779—Men's black calf, sizes 5½ to 11, B to E; C-2776—Women's tan willow calf; C-2777—Women's black calf, sizes 3 to 8.

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The durability of leather clothing, as well as its protective features, recommends it to aviators as most practical.

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Made of genuine black horsehide glove leather and lined with good quality moleskin cloth. Double seat and knees—two large pockets, two hip pockets and watch pocket.

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Other aviator's breeches in Bedford Cloth, Imitation Bedford Cloth, Imported Cavalry Twill range in price from $7.50 to $20.00. Order from this ad.



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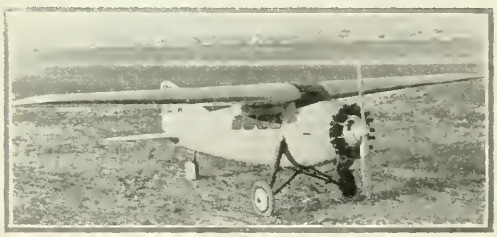
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AIR—HOT AND OTHERWISE

(Continued from page 923)

ribbed, fearsome valleys, the thirsty, threatening deserts, the broken, virtually impassable reaches—the traveller will soar over them as if they were not there.

Contrast the motive force of the modern travellers, three Pratt and Whitney 400 horsepower Wasp engines, with the plodding oxen, or weary mules and horses of their progenitors along that route. Three-quarters of a century ago!

Many of the Eighteen-forty-niners had their difficulties in financing their then tremendous journeys. These Nineteen-twenty-eighters purchased their equipment for one plane at a price which would have fitted out a whole great wagon-train in the old days under an equipment loan arranged with the Daniel Guggenheim Foundation, established for the purpose of helping the United States to keep its rightful place in the world's air effort.

And once again our hat is off to Daniel Guggenheim. It comes off every time we think of him. It was not philanthropy which led him to establish the great fund which bears his name, and serves the cause of human flight. That he has become the Patron Saint of American aviation is not the result of charitable thinking, but that of an accurate imagination which sees how the development of this country can be hastened by encouragement of air transport.

I am glad to proclaim Daniel Guggenheim something far more important than a sentimentalist. The highest compliment that aviation had had up to the time he recognized its import with the appropriation of his millions was the fact that he, methodically, calmly, with that practical hard sense which always has characterized him, had decided that the game was worth his time, his money, and his trouble.

That these three men I have mentioned have been selected by him as among those with whom it seemed to be worth while to heartily co-operate was the highest compliment that could have been paid to them.

They are the sort who will mean much. The Western Air Express pays dividends. With the expansion of activities which is now at hand it will pay bigger ones. It is operated ably, economically. It never has depended and does not now depend in any sense on stock promotions. It functions every day in every way to pay.

An example of the mental workings of its management: The planes were finished and ready to fly West a week before their new owners started with them. But they were in no hurry. For a week they used Mitchel Field as a base and flew for trips every newspaperman in New York that wanted to fly—flew him and his wife and family if so desired.

In that way these men out of the West did more to convey into the minds of those who every morning spread the world's facts before the American public, the conviction that flying is not dangerous than could have been done by any other possible method. The great part flying is to play in the economic and even the social life of the United States was thus demonstrated to those whom it was perhaps most worth while to impress with the important facts.

These Westerners weren't looking for publicity. They were seeking to inform the publicists. Whenever those newspaper people think of flying in the future they will think of it as something practical, not as a stunt. That was something real accomplished.

In other words the Western business aeronauts are not newspaper hounds—they are conservative constructionists

(Continued on next page)



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Registered Trade Mark

Bringing a new era of Safety—Economy—Ease of Control and Luxury

THE MONOCOUPE points the way to the plane of tomorrow. It sets a new style in smartness, fine performance and ease of control. The comfortable, mohair upholstered cabin eliminates the need of race track togs as well as fatiguing propeller blast, motor soot and gases. Its safety factors are far in excess of requirements established by the Department of Commerce regulations.

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Builders of the Monocoupe and the Monocoach

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Well. Well

What have we here?

None other than a popular impression of little Johnny learning to *Fly* by MAIL! First thing you know he'll have his correspondence school diploma —and then watch out Lindy! If Johnny doesn't hop to Mars it will be Mars' fault entirely . . .

Funny, eh? Oh very. That is—it *would* be funny if the whole thing weren't so grossly misunderstood. In the first place, Johnny's mail instruction makes no pretense of teaching him to *fly*. In the second place, Johnny is apt to do real things in Aviation. He has the stuff. He's getting the training—good training—in the one way that is practical for him.

Please Understand —

Aviation Institute of U. S. A. is a correspondence institute. I don't "admit" it; I'm proud of it. I do ***not*** attempt or claim to teach flying. I *do* teach the fundamental facts of Aviation — the essential *ground-work* — to men who can't attend an Aviation class-room.

You know that the Industry needs employees who have a *working knowledge of Aviation*. My course is thorough and practical. It successfully gives serious minded men a working knowledge of the theory of flight, aerodynamics, plane design and construction, rigging, repairs, motors, commercial Aviation — basic facts which turn fumbling tinkerers into level-headed *assets* to any employer. These students who then wish to go ahead and learn *flying* are sanely referred to their nearest field, allowed special rates and make good sooner because of my preliminary training.

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"Ask the Pilots Who Land on Them"

AEROL shock absorbing STRUT

(Continued from preceding page)

embarking on a new and splendid business which has not been established long enough to have created precedents in every detail of procedure. When they started West each of the three planes of this splendid commercial escadrille took a different route, scheduled to stop at every important city beaded on it so that it might there repeat the educational effort which had been made in the New York territory.

BUSY months, these, for air transportation and those interested in it. Many momentous things are under way and bigger ones will come.

Why, here's another good sized one, already! On May 21, William B. Stout, head of the Airplane Division of the Ford Motor Company, announced in San Francisco that a Transcontinental Airline having the backing of the Ford interests probably would be put into operation this summer. It was his belief that this would be planned and equipped to give a twenty-four hour service between Atlantic and Pacific a year hence.

He would not give many details. The Ford group does not do things that way. They spend their own money in experimentation and when they know they're right they move and move fast. Until they know they're right they do not move.

One hundred per cent service is synonymous with anything that the Ford name is connected with. It will be well to keep this group within the range of vision, for its entry into the Transcontinental Derby is sure to be a good one, with a good chance of winning first money.

IT'S a great world, with this and other air-transport propositions just budding and before long sure to bloom. Why shouldn't we be happy? It's a fine world—but, hold on! Just as we are about to quit and call it a full editorial day, with those glad words smiling on the sheet before us, we catch sight of a newspaper clipping from which the following headline stares straight into our eye:

"STUNTS BLAMED FOR MANY CRASHES. EIGHTY PER CENT OF AIR FATALITIES CAUSED BY DISOBEDIENCE."

These startling words are followed by pish-tush column emanating from the Navy publicity department, where the propaganda mills grind continuously and at present seem to constitute the greater part of the United States Navy's activities. Our old friend Wilful Wilbur must have used the card of introduction that we sent to him last month when we mailed this page to his address at Washington, D. C. We were afraid he hadn't got it, for we didn't put the street and number on. But somehow the postman must have known just where he lives, or perhaps he had his office address. These postmen are so clever.

At any rate the daily newspapers indicate that shortly after he received our envelope and its enclosure he found out that there is a Bureau of Aeronautics.

We are almost sure of this, for he started an investigation of it. Of course there is the possibility that some midshipman or even some Little Buttercup on leave from a destroyer and drifting about the Navy building, saw the need of it and started it without his knowledge, but we don't believe that is the case. We earnestly opine that Mr. Wilbur started it, our own pleasant, genial, Wilbur.

At any rate Wilful Wilbur found out about the Bureau of Aeronautics, as it was inevitable that so dazzling an intelligence as his would. That's something accomplished. Nothing in the Navy can be concealed from Wilful Wilbur for very many years. *(Continued on next page)*



THE AIRMASTER COUPE

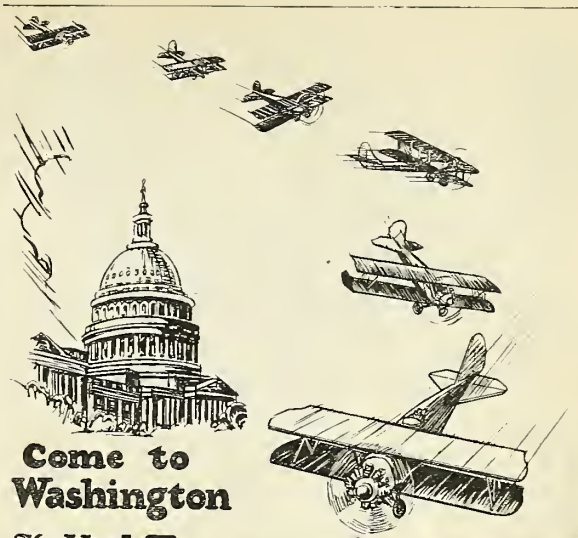
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Every plane is a new Alexander Eaglerock. In our machine shop you have the right tools to work with. And understand—this is more than just a theoretical "classroom" sort of institution. Mount Vernon Airways Inc., is an actively operating airport. Passenger flights, long distance transportation, private plane servicing—we do all of them. You learn by **doing**—not just by reading or being told. You learn motors, construction, rigging, repairs, instruments—**all** the mechanical facts. And here the Flight Training is under thoroughly experienced instructors. You not only get your "ABC's" of aviation; you get your actual, practical **start**. And at a reasonable cost—the smallest sort of an investment for the man who is staking himself to a genuine future.

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brings facts

This book has been prepared to help you get into this fastest growing industry. It explains in detail just what you need to get the Aviation job you want. It outlines the three Complete Courses which Mt. Vernon Airways, Inc., offers those who are ready for intensive training for Private Pilot (10 hours' flight), Transport Pilot (50 hours flight) or Aviation Mechanic, including, in addition to shop-work, a comprehensive training in the theory and practice of Aviation. There's no obligation in asking for your copy of this book—it's FREE. Clip the coupon and send it **now**!





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Comfortable cabin for 10 to 12 passengers, including crew.

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Rudders and elevators sufficiently high to prevent damage while landing or taxiing on ground or water.

Excellent visibility for pilot and passengers.

Crew, passengers and all vital parts of the plane, such as control cables, tank, etc., are located out of the plane of propeller rotation. An unusual feature for a multi-motored plane.

Quick take-off, good climb, high performance and exceptional maneuverability on land, water and in the air.

Write for Particulars

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College Point, L. I., N. Y.

(Continued from preceding page)

And having found it out he announces that the Bureau forthwith is "under scrutiny" by a Special Board of Inquiry. And so that there may be no misunderstanding he declares that Rear Admiral Leigh, Chief of the Bureau of Exaggeration (beg pardon, Navigation) shall get busy on the job.

Admiral Leigh declares that the Bureau of Aeronautics cannot be held responsible for accidents due to disobedience of orders. Neither can it be compelled, we hasten to exclaim, to accept the blame for submarine disasters or the waste of taxpayers' money. That's where the Bureau of Aeronautics differs from the Bureau of Navigation. That's where it differs from the Navy as a whole.

Great. Investigation may reveal how Wilful Wilbur has tried to crash the Navy's air effort. But, while we're crashing why not crash the things which actually may heed it? Why be retail when you start out to investigate? If the Bureau of Aeronautics is to be subjected to the W. W. "scrutiny," why not the whole Bureau of Navigation? We have our shrewd suspicions that interesting details of the general Navy management might be revealed forthwith. And incidentally, here's one more possibility of the Secretary's double doubleyous. Can they really stand for "Worse and Worse"?

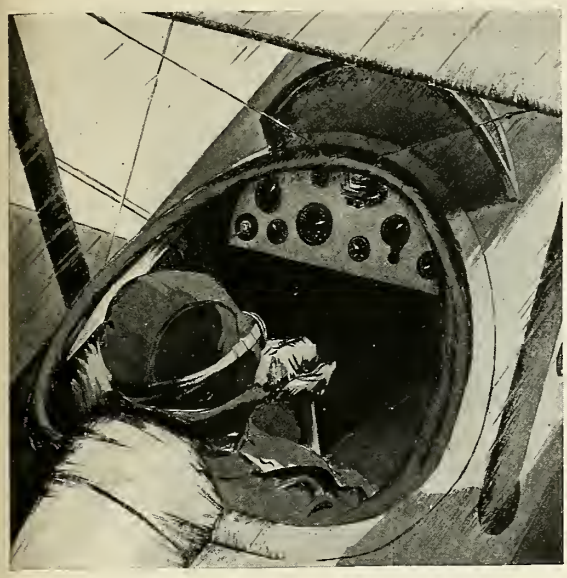
And to return to the tool house, again picking up the muck-rake, why, even, stop investigation at the Bureau of Navigation? Why not investigate the whole darned Navy? A most interesting subject. There's a craze in these days for antiquities. See the time and money spent on digging into Tut-ank-Ahmen's tomb. Modern stuff compared to some minds in the Navy. Only one place need be utterly omitted we sometimes are convinced. An investigative group, calling at the Secretary's office and knocking timidly upon his dome of thought might get the answer, in a still, small, funny voice. "Nobody home. Ring off. Wrong number." So that need not be studied by investigators. We fully understand it.

The whole Navy under Secretary Wilbur might be dredged with good result. Deep and murky waters, but with fascinating things half-buried in the bottom mud no doubt. The curiosities of departmental politics which the dredges might bring up doubtless would make the product of that Hamburg poison-gas plant that killed dozens recently smell like the product of our French friend, the perfume manufacturer Houbigant; the extravagant use of great funds which probably would be revealed would very likely break the nation's mighty record at such curious endeavor; the presence of pretty, pretty ladies on Uncle Sam's destroyers, hitherto supposed to be Edens without Eves, would supply romance; and, as a grand climax, a real investigation inevitably would bring out the fact that battleships and cruisers are as useless to the national defense in these days of aerial attack as whiskers would be on a bust of Cleopatra.

There is a real suggestion. Investigate the Navy as a whole, friend Wilbur. God knows what you'll find, but we have not the slightest doubt that it will be extremely interesting. Get busy. Train the Naval bands to play the Dredgers' Chorus and then dredge. You'll certainly bring something up. Barnacles are elsewhere in your great department than on the foul bottoms of your ships returning from the tropics.

Perhaps a real and general investigation would reveal the mystery as to why the fifty-seven varieties of admirals in Washington and at the Navy Yards spend so much of their time at teas and other sports which recently have become the ultimate of vigorous amusement for so many of our

(Continued on next page)



Don't economize on instruments

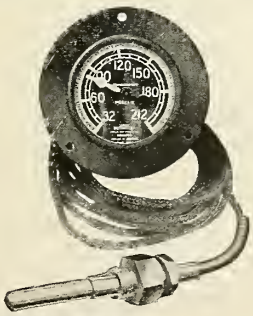
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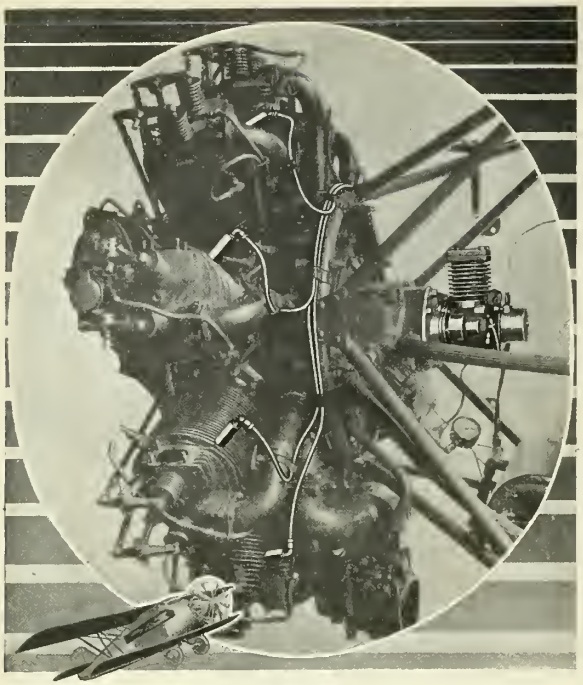
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(Continued from preceding page)

highest Naval officers. Perhaps investigation might give taxpayers some schedule of the time and effort which our Naval men devote to lobbying for absurd appropriations which will furnish funds for their expenditure in junketing expeditions to warm countries as soon as the thermometer begins to drop up North.

Perhaps investigation might reveal the splendid sporting record made by social tuft-hunters among our gallant sailormen when Newport and its social gayeties are open to them without charge (all other citizens must pay on entering the car, please). Perhaps investigation of the Navy as a whole might even make clear to the world just why the Bureau of Navigation never has co-operated a hundred per cent with the Bureau of Aeronautics, the newest but the most necessary branch of the whole service.

We suggest that principal among the findings of the right sort of investigation of the Navy as a whole would be the suggestion to the Naval Secretary that he encourage Admiral Moffett, that he give him the appropriations asked for so that he may get the planes he needs to train the personnel that will form the only force which possibly can make the nation safe. If the Secretary of the Navy would change the meaning of his leading W to Willing instead of Wilful, cut with his little hatchet the red tape which binds the Bureau of Aeronautics, we would have a better aviation service in the Navy and a very much better Navy to match the aviation service. We would have fewer accidents of all kinds, from nose-dives in the air of planes to nose-dives in society of young subalterns who cannot carry the traditional Naval gallon in these days of bootleg. Having a better aviation service we then should have a better Navy and there would be no need for investigation.

UNIFORM STATE REGULATION NEEDED

(Continued from page 929)

be readily appreciated that those States which have passed legislation requiring Federal licenses would be caused no embarrassment or expense by reason of any such amendment to the Air Commerce Act of 1926.

Prior to the passage of the Air Commerce Act of 1926 some of the States enacted legislation more or less along the lines of the Federal Air Traffic Rules, such as prescribed minimum safe altitudes of flight, hunting from aircraft, defining torts and crimes committed in aircraft while in flight over that particular State and making the operator or owner absolutely liable for all damage occasioned by such aircraft. It is believed that such States should enact new legislation to meet the progress which aeronautics has made during the last two years.

In conclusion it is recommended that wherever possible all States enact legislation requiring all aircraft and pilots operating within the State to meet the minimum requirements of the Department of Commerce, and to obtain a license from such Department. It is only in such an event that the purpose of the Air Commerce Act can be fulfilled; namely, the promotion of commercial aviation and the development of its usefulness to the fullest possible extent in the United States, where aviation found its inception. It is believed that this can best be done by the promotion of public confidence in it—a confidence that will take it for granted in the same manner as it does the automobile, the railroad, and the steamship. This can best be accomplished by bringing about the combination of four essentials: airworthy aircraft—efficiently maintained; competent pilots; suitably equipped airways; and standard air traffic rules.



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HUMAN EQUATION IN AIR CORPS

(Continued from page 925)

photographic officer of the expedition which explored the Amazon river by air, is still in the service with the rank of captain.

While flying officers do not talk about the hazards of the service, those who keep in touch with events know that the hazard is there The recent Pan-American Good Will Tour was one of the most successful ever made, in accomplishing its purpose of creating international good will, and reflected great credit on Major H. A. Dargue, its commander, Captains Ira C. Eaker, Arthur B. McDaniel, and Clinton F. Woolsey, and Lieutenants John W. Benton, Muir S. Fairchild, Ennis C. Whitehead, Leonard D. Weddington, Bernard S. Thompson and Charles McK. Robinson. It was not completed without cost of human life, however, Captain Woolsey and Lieut. Benton being killed in a collision at Buenos Aires, Argentina. Their plane collided with another plane in which were Major Dargue and Lieut. Whitehead, who jumped with their parachutes and escaped injury.

Captain Eaker with F. Trubee Davison, Assistant Secretary of War for Air, and Lieut. Fairchild with General Fechet, Chief of the Air Corps, have recently completed a flight from Washington, D. C., to the Canal Zone —the first time an official inspection of any of our foreign possessions has ever been made by airplane.

One does not wish to dwell on the Air Corps Honor Roll, but one remembers the shock with which he heard of the deaths, for instance, of Lieut. Cy Bettis and Lieut. E. H. Barksdale.

Lieut. Bettis had won the Pulitzer Race in New York in 1925 at the speed of 249 miles an hour. On August 23, 1926, while en route to Selfridge Field he encountered fog and storms in the vicinity of Bellefonte, Penna., and was killed when he struck the mountains.

Lieut. Barksdale had been test pilot for a number of years at McCook Field, when he met his death there August 11, 1926, while testing the spinning characteristics of an O2 airplane.

Just after the New York Pulitzer Races I talked with Lieut. George H. Burgess on Bolling Field. The next day from an emergency field where my pilot had landed in the storm we saw Lieut. Burgess fly past, to crash about 10 miles farther on near Uniontown, where they have named Burgess Field for him.

Not so unpleasant as the casualty list, but nearly as regrettable, is the loss to the Air Corps of splendid flying officers who leave it because of what is termed in the Military Affairs Committee report as the "years of stagnation in the junior grades."

There was Lieut John A. Macready, once distance endurance and altitude titleholder. May 6, 1921, with Roy S Langhan he made a world's record two-man altitude flight, attaining the height of 34,150 feet. September 28 of that year he flew to the height of 37,800 feet, and January 29, 1926, set a world's record of 38,704 feet. With Lieut. Oakley Kelly he made the first non-stop transcontinental flight on May 2-3, 1923, covering the 2,516 miles between New York and San Diego in 26 hours, 50 minutes. He was still a lieutenant when he resigned from the service to associate himself with a commercial company.

So was Lieut. Burdette S. Wright, war pilot, advance agent for the Round-the-World Flight, Chief of the Airways Section, and in many responsible posts before he gave up his lieutenancy last year.

There's Lieut. Harold R. Harris, Chief Test Pilot at

(Continued on next page)

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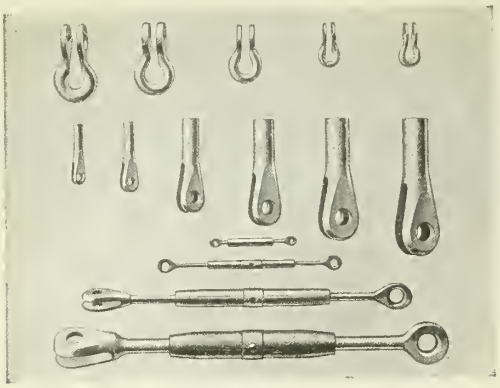
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(Continued from preceding page)

McCook Field for several years. He was the first pilot to fly the Barling Bomber which, in 1923, was the world's largest airplane. He held many world's records, and was still a lieutenant, when he resigned in 1926 to take command of a fleet of cotton dusters, down South.

Lieut. Corliss C. Moseley won the first Pulitzer Race held at Mitchel Field, Long Island, in 1920. He was still a lieutenant when he resigned from the Air Corps in 1927 to become Vice President and Operating Superintendent of Western Air Express. His line operates mail, passenger and express carrying between Los Angeles and Salt Lake City, and has been an outstanding success.

Lieut. Leigh Wade piloted the "Boston" on the Round-the-World Cruise. He was a lieutenant when, in 1922, he piloted three passengers in a Martin Bomber to an altitude of 23,350 feet, and was still a lieutenant when he resigned in 1926 to associate himself with a prominent aircraft manufacturing concern.

Lieut. John (Smiling Jack) Harding of the Round-the-World Flight ended his lieutenancy by resigning, and is now connected with the Aeronautical Chamber of Commerce.

The list might be indefinitely lengthened, but to what purpose? It represents, as I said at the beginning, the romance and the tragedy of service in the Air Corps. There is opportunity there for the finest service, and no flier so far as I know has ever shirked it. But its sacrifices and its hazards ought to entitle the flying officer to a chance of moving up—of escaping from a stagnation into which circumstances which were nobody's fault have involved the Air Corps. For one, this writer hopes that the favorable report of the House Military Affairs Committee presages the early correction of an injustice which affects one of the finest bodies of American young men whom it has been his privilege to know.

GROUND FLYING

(Continued from page 944)

he had replaced his lunch was that the day was moist and muggy and the ship must have skidded on the humidity.

So we will leave this relatively unimportant detail of actually flying a plane, and take up those more practical considerations which are necessary for mastery of the air.

The first of these is costume. The new race or breed of aviators has upset many things, including our estimates of time and space, the hearts of numerous flappers, and quite a number of valuable airplanes, and has also revised our idea of what the well-dressed man will wear if no one stops him. You will therefore need a pair of leather leggings to keep the slipstream out of your underwear, and a leather helmet to keep the billows in your permanent wave. In these you will look like a cross between a cavalry officer and a football player, but the girls will like it.

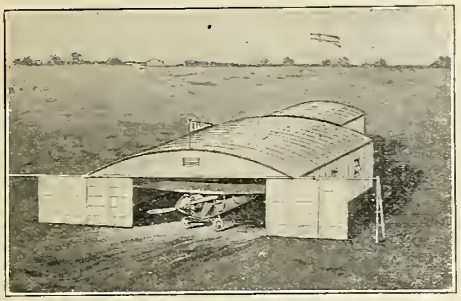
Next you should learn your cigarette technique, so that you can be all lit up and looking nonchalant in five seconds by a stop-watch from the actual moment of the crack-up. You should also go out in the garage and practice cocking your head at a gasoline engine and looking as wise as an owl, after which you turn the motor over to a mechanic and sit down to figure flying time. Finally you should master the art of looking at the scenery while your girl friends climb into the cockpit, and you will be ready to take up the actual study of the plane itself.

An airplane is a cross or hybrid between an automobile and an umbrella. If you can get an umbrella up in a crowd you ought to be able to get an airplane up in a fifty-acre field, and as long as you keep it up you have

(Continued on next page)

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AIRPLANE DESIGN

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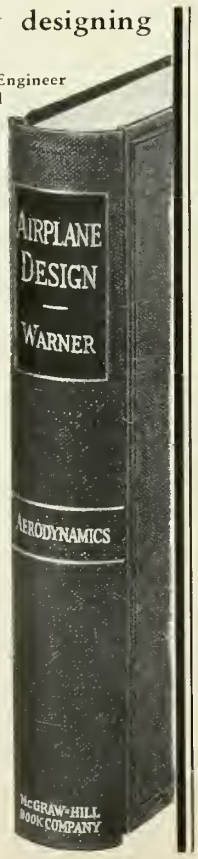
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— slotted wings;
— wind tunnel tests;
— turning without side slip;
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(Continued from preceding page)

practically nothing further to worry about. If you can make an automobile go you can make an airplane go, and with very little encouragement an airplane will stop itself. When it does by colliding with the ground you call out "Contact" and have your picture taken for the papers.

Airplanes are used for dropping advertising on football games and prizefights, for testing weather conditions on the Atlantic, and for exploring the North, South and all intermediate Poles. They inhale gasoline and exhale castor oil, and the higher they fly the fewer. They are not quite as efficient as automobiles, since they still lack a differential and four-wheel brakes, but they are very durable. No one has yet determined the life of an airplane, because no airplane has ever lasted that long.

Now that you understand the airplane it is time to take up meteorology and aeronautical law. Meteorology is a simple device for distinguishing one kind of weather from another, and leads at last to the conclusion that there is really nothing you can do about it anyway. Aeronautical legislation is even more important, since there are a number of laws that now govern aviation in addition to the law of gravitation. You should observe them all, particularly the blue-sky laws, and read the Congressional Record daily for further instructions. Observe all local traffic regulations. Philadelphia, for instance, is fundamentally opposed to left hand turns; New York is a bad place for pilots, especially around 42nd Street after 10:30 in the evening; and you can get away with anything in Chicago if you have an Irish grandmother. Pass other planes on the left or right, as the case may be, and in any bad traffic jam use your good sense and a parachute. Give all lady pilots at least a thousand yards clearance. In case of back seat driving by the passengers, remember that a short roll and a tail spin will work wonders.

On looking over the above and comparing it with the courses advertised by my competitors in my favorite aeronautical magazine, I find that there are a few points I have missed. They aren't important, but those of you who want to hitch the wagon of your ambitions to the star of aviation should have the whole works. It is no longer necessary to urge you into aviation; it is no longer necessary to tell you that here is a new profession, a new opportunity, a new challenge to the spirit and energy of youth; it is no longer necessary to tell you that the prizes of progress are for those who will go after them. But it is worth while to tell you to watch your step, and particularly the first step you take in the new highway of the air. And if you don't mind, I'll just add these Fourteen Points for Future Fliers and call it a day.

1. The mere fact that you want to be a pilot won't make you one. The bigger the job the harder you have to work for it, and you must make up your mind to work, wait and worry, if you want to win out in the keen competition for a place on the air map.

2. Don't waste your time, while you are collecting cash for a flying course. The more you know, the quicker you will fly and the better you will fly, and the greater will be your chances for a real job.

3. Get acquainted with a gasoline motor. When you can take the engine of the family flivver down and get it together again without a whole lot left over, you will be ready to look at an airplane motor without blushing.

4. Read books. There are lots of them on your subject. If your library doesn't have them, keep asking for them until they do something about it. Spend some of your loose cash on some of the best and learn them backwards.

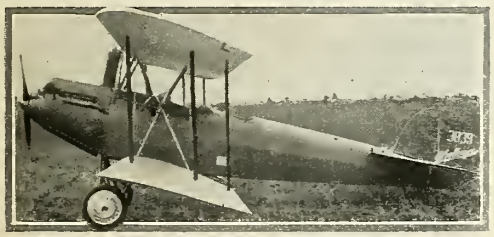
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(Continued from preceding page)

5. Read the aviation magazines to keep you on your toes and up to the minute.

6. Go to flying fields and factories and ask questions. Get the *fool* questions out of your system as soon as possible and then ask those that count.

7. Study the air map—airports, airways and mail routes.

8. Study the air news. Try to get back of the newspaper talk to the facts of the case and what the facts mean.

9. Keep a scrap-book on aviation. Classify your clippings so that they mean something.

10. Join up with a *good* correspondence school. By doing so you will save your own time and that of your instructor. At least he won't have to teach you the language.

11. In picking your school, correspondence or flying, remember that the noisiest is not necessarily the best, and that some of these advertisements which talk of the promising career of aviation are more interested in the promises than in the career. Remember that the hen which cackles too loud is just as likely to be lying as laying.

12. Don't expect to be a pilot after six hours in the air. Read the Department of Commerce regulations and see what you are up against.

13. Don't go off half-cocked or tackle something you can't finish. Figure the time and money you need to qualify for a job. Every other profession calls for time, money and patience while you are breaking in. Don't under-rate the flying profession by expecting to make it in one jump.

14. Don't hesitate, if you are ready to go ahead. There's a job ahead and time is at your heels. And don't let your mind get single-tracked. Aviation needs not only pilots but mechanics, designers, craftsmen, executives, salesmen, advertisers and what have you. Learn all you can while you can, so that when an opening shows up you can crawl neatly and gracefully into it and hold it against all comers.

I don't know whether this is as good advice as I think it is but I'm quite sure that a lot of people won't take it. Those that do, however, are going to have an edge and save themselves a lot of grief. The rest will be taken care of by those who know how to cash in on other people's trustful innocence.

AERIAL "WAR" AT LANGLEY FIELD

(Continued from page 928)

any enemy these youngsters of the sky went after!"

And again, or probably I imagined it, their faces seemed to say: "There can be no infantry, no navy, with such instruments of war. And we cannot have too many planes nor too many trained young 'daredevils' like those up there now."

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"Where would the anti-aircraft guns be now?" I heard a war veteran Representative ask another.

Next, came an attack upon a captive balloon. Three pilots dived once upon the great bag. The second, Lieutenant Clayton Bissell, diving with wide open throttle, brought a gasp of astonishment when he apparently dived

(Continued on next page)

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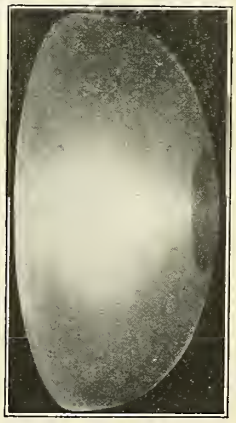
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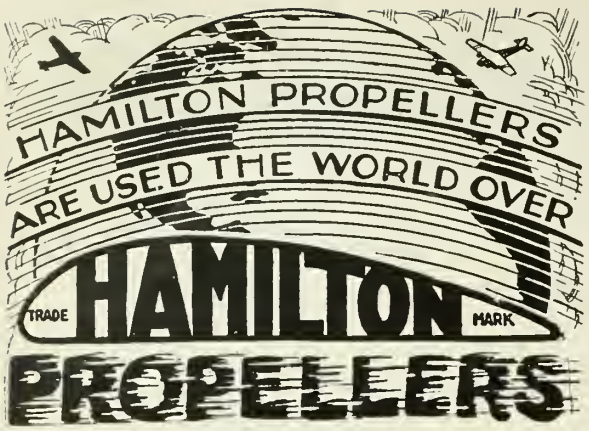


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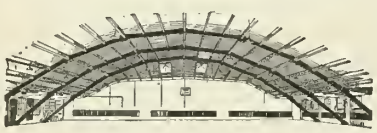
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(Continued from preceding page)

straight into the silken bag. Instead he skidded off, zooming through smoke and flame, it seemed to the watchers, on the other side of the bag as it dropped lazily to the ground.

The spectators, sneezing and wiping reddening eyes, were not left long in peace. Three other machines appeared overhead. They dived, barrel rolled, turned flat upside down, spiraled into whipstalls—and dived again.

After lunch the spectators were carried to the balloon hangar, one-half mile from the "bombing grounds.

Then the real fun started! First, there came the attack planes, six guns on each spitting vehemently at mythical troops, salvos of bombs falling when cartridge belts were emptied. The bombers followed, deafening the spectators, and causing the big balloon hangar to shake.

Curtiss Pls, their D-12s sending their challenge to awe the lawmakers, followed to "clean up" whatever the preceding flights had left.

But by this time, had the three squadrons disappeared straight into the heavens, the assembled Congressmen would not have been surprised.

They came—they saw—and I'll be darned if they weren't convinced that those men who rule the Air Corps know what America needs—more airplanes and more of these skillful pilots!

ALICE IN NAVYLAND

(Continued from page 938)

done with political appointees. You should see them."

"The plumbers are all carpenters and the carpenters are all plumbers," said the March Hare.

"We had a terrible accident in the works the other day," said the Hatter, taking a bite out of his tea-cup. "A steamfitter joined us and we put him to work fitting steam pipes. It nearly caused a revolution—he should have been posted to the awning department."

"I found him just in time," said the March Hare, "and set him to work wiping olive oil off the sardines."

The Hatter took a watch out of his pocket, looked at it, shook it, and said, "I told you butter wouldn't suit the works." He looked angrily at the March Hare.

"It was the *best* butter," said the March Hare meekly, "the kind we grease the motors with."

"Yes, but some crumbs must have got in as well," the Hatter grumbled. "You shouldn't have put in with the bread knife."

"I'll try oil next time," said the March Hare.

"Don't mention oil," stormed the Hatter. "Our oil reserves have Fallen."

"Since when?" asked the Hare.

"Sin' Clair!" screamed the Hatter.

"If you're going to pull anything like that," said Alice, "I'll have to be going. I don't mind stories, but I can't stand puns."

"Speaking of jokes," remarked the March Hare, "have you seen the Duke lately?"

"I think he and the White Rabbit have gone to play golf with the Duchess," said Alice.

"Let us join them," said the Hare and the Hatter, marching off rapidly, with Alice right behind them.

They hurried out of the building and walked across a beautiful green lawn. "Every blade of grass cost a dollar," the Hatter told Alice.

"That seems an awful lot to pay for it," she said.

"It was put in under a Navy contract," said the Hare.

(Continued on next page)

AIRCRAFT MOTOR

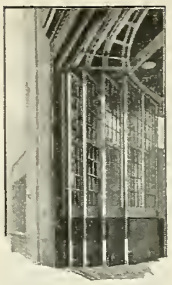
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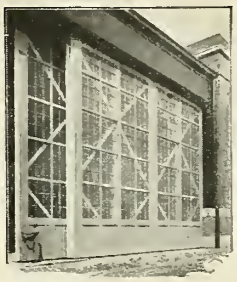
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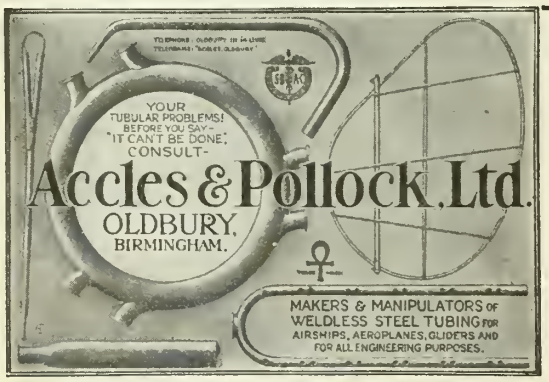
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(Continued from preceding page)

"With the right people," added the Hatter. Then they linked arms and sang together in loud tones, "What a wonderful system the solar system is," ending with a howl: "but it hasn't got a thing on the Nay-vee!"

"What's all that row?" asked the Duchess angrily, as they walked up to her.

"We were singing the National Anthem," said the March Hare and the Hatter, both together. "You're looking charming, Duchess. You haven't changed a bit since the Spanish-American war."

"I should hope not," said the Duchess. "I never change."

Upon which the March Hare and the Hatter sang:

"Some people change to B V D's when summer comes
along.
"But we never change a thing in the Nay-vee."

"A sweet sentiment," smiled the Duchess. "Don't you think so, my dear?" She beamed at Alice. "But come, we'll play golf. You'll enjoy it—it costs quite a lot."

A flock of Fish-Footmen came running with bags of golf-clubs and balls. The balls, Alice noticed with some surprise, were all made in the shape of little men, and were marked Tax-payers.

"The idea of this Naval golf," said the Duchess to Alice, "is to swat the Tax-payers as hard and as often as possible. You try to drive them to Desperation—like this:"

She set a little ball, or Tax-payer, on a bit of sand, and hit it a hard swat with her driver. The Tax-payer rolled a few feet, and stopped with a groan.

"Topped it!" shouted the Duchess angrily. "They're contrary things, drat them! You just have to keep pounding them to get anywhere. You try it."

She glared angrily at the Duke of Potomac, who grasped his club, marked Naval Appropriations, and swatted the Tax-payer a good one. "Ah, I made him get a move on," said the Duke happily.

By this time the Mad Hatter and the March Hare and the Duchess were swatting the little Tax-payers all over the place. Even the Footmen took clubs and proceeded to drive all the Tax-payers toward Desperation. They went bounding across the grass with the docile aspect of real golf balls. Not one of them ever spoke back or tried to bite any of the players. Alice felt quite sorry for the poor little things, but she needn't have been, for they were taking the hammering quite good-naturedly.

"They don't feel it," the March Hare told Alice. "There's no feeling in a Tax-payer at all."

"I think it's a shame," cried Alice. "abusing them like that."

"What's that!" screamed the Duchess. "Who's saying a good word for the Tax-payers?"

"I am," Alice began, when the Duchess leaped for her. Alice tried to protect herself, and struggled desperately. But she found herself falling, falling, back on the grass. There she lay, looking up at the sky. She began to cry, for the old Duchess had frightened her terribly.

"Why, Alice dear, what's the matter?"

Alice looked up—and there was her sister bending over her. She began to cry now with relief.

"Oh," she cried, "I had an awful dream—I thought I was in the Navy!"

"There, there," her sister soothed her. "It was only a dream, dear. Your old Navy was only a dream."

"I know it was only a dream, now," sobbed Alice. "But those poor little Tax-payers! They were part of it. It wasn't a dream to them. It was a nightmare!"

(Editor's Note: The further adventures of Alice in Navyland will be continued in an early issue.)

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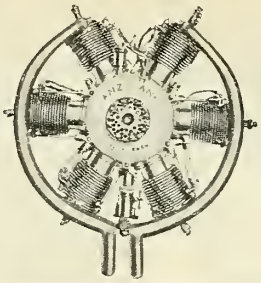
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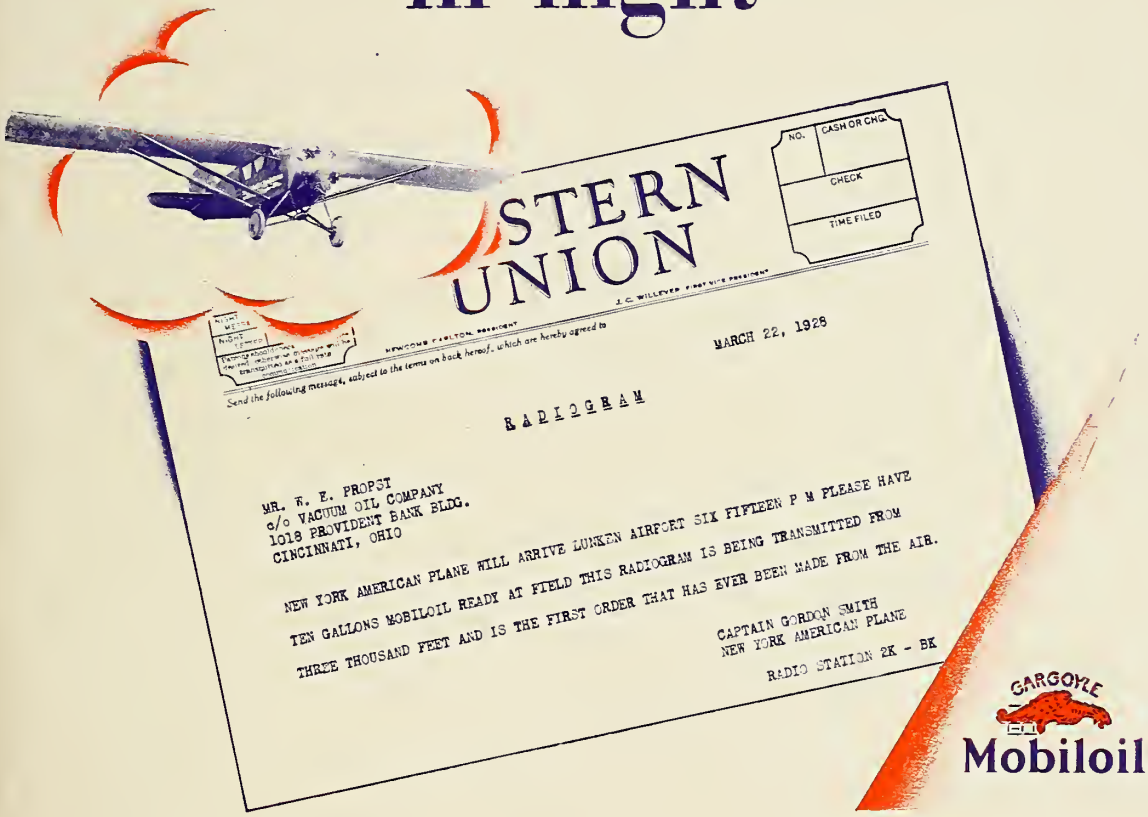
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Throughout the tour the Stinson-Detroiter Cabin Monoplane was lubricated with Gargoyle Mobiloil.

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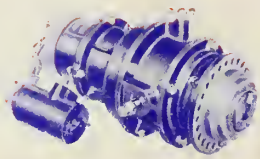
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If you are interested in matching the ease of automobile starting for your plane, write us for full information about Eclipse Electric Starters and Generators.

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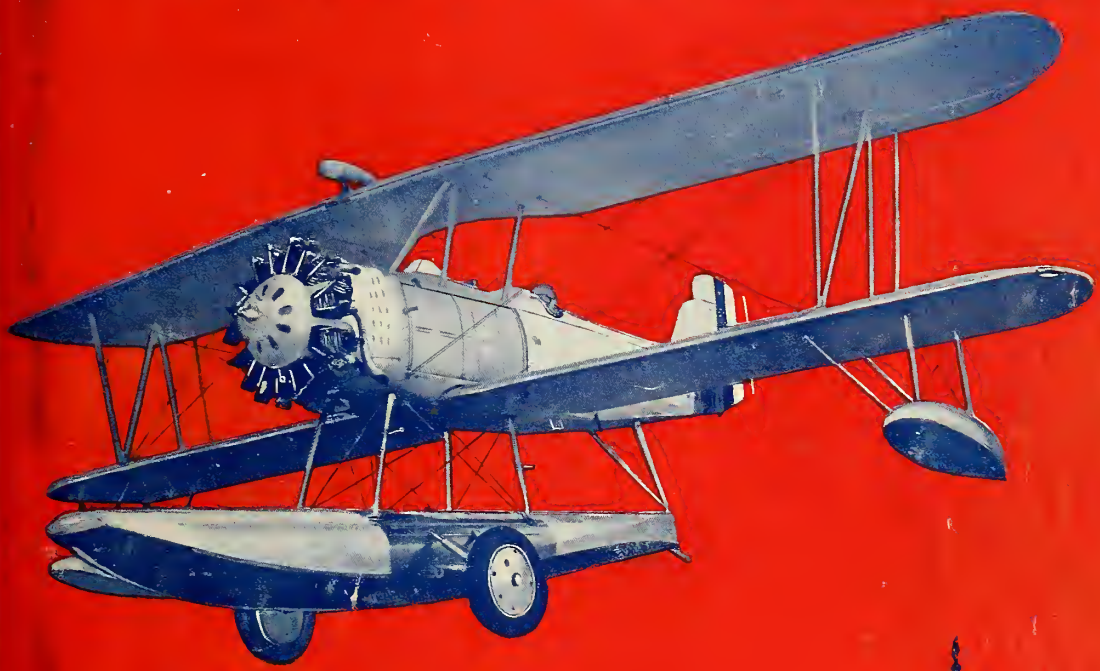
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Vol. 13 No.1 JULY 1928 25 CENTS

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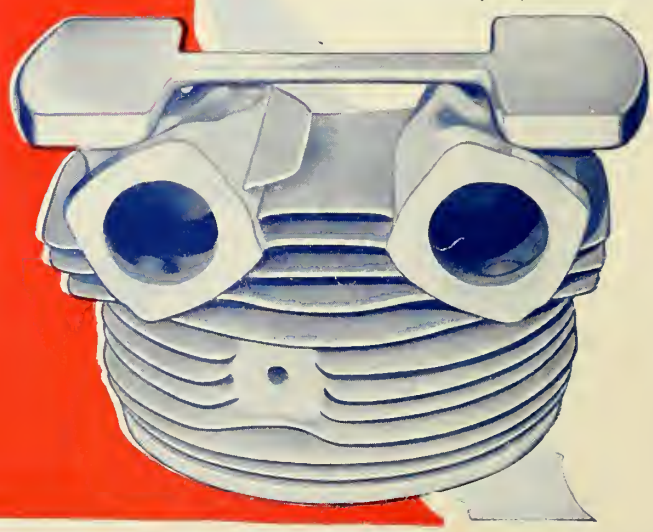
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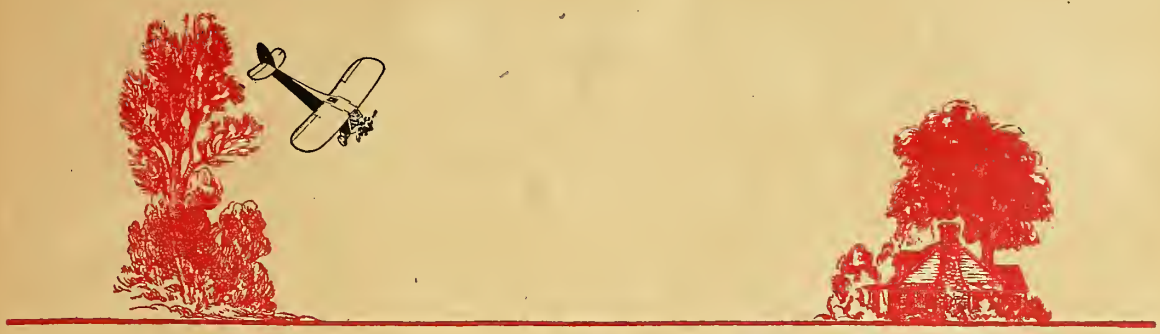
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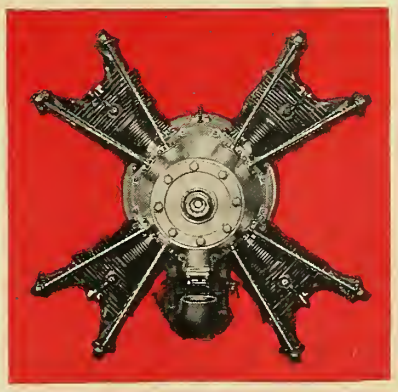
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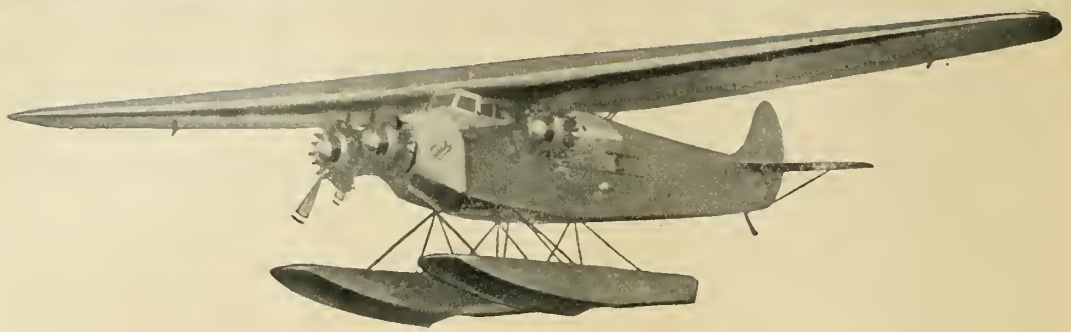
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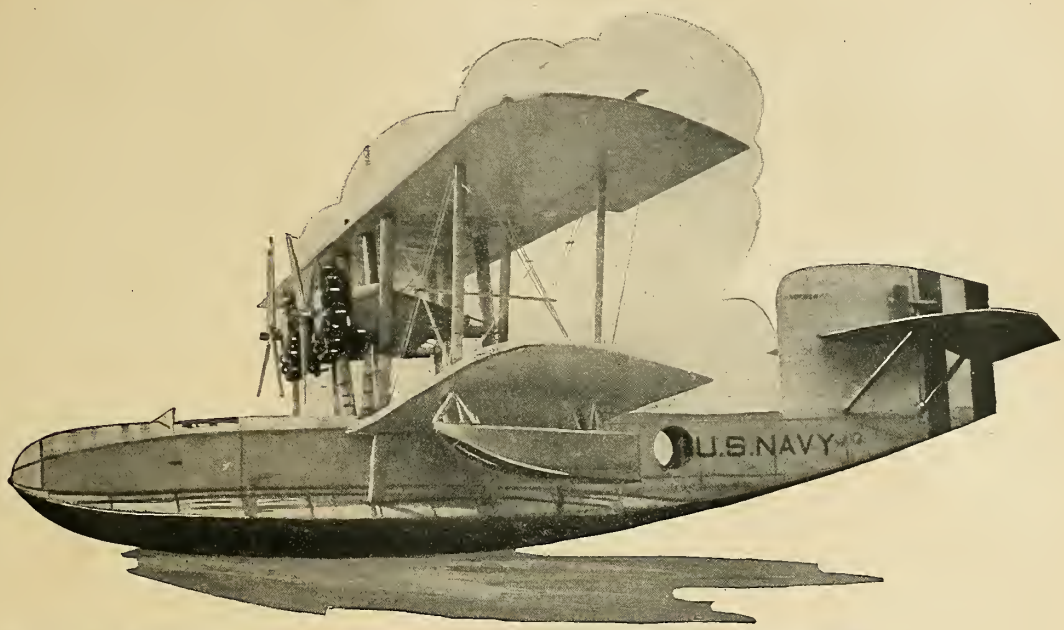
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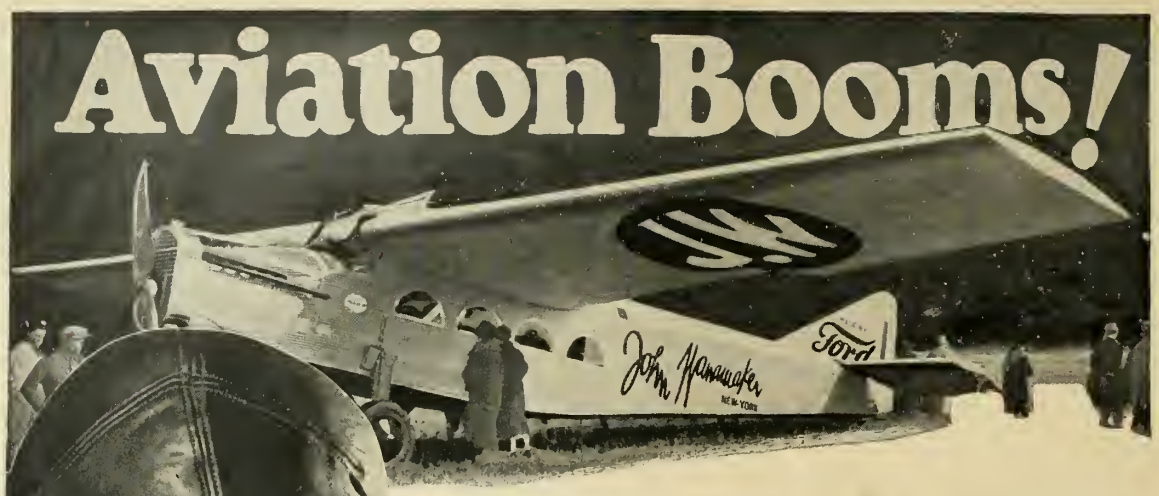
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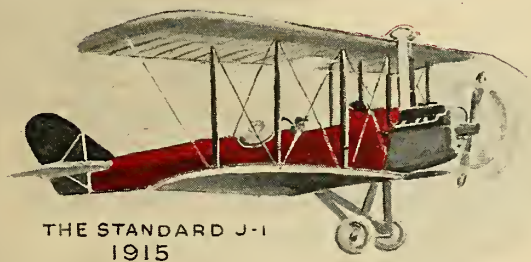
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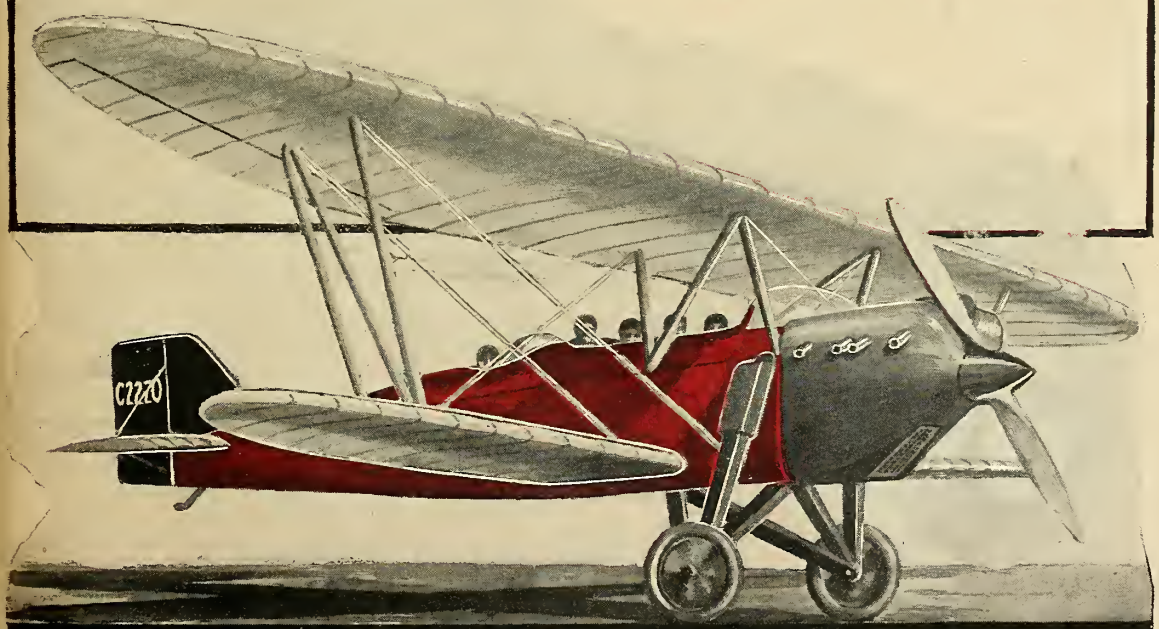
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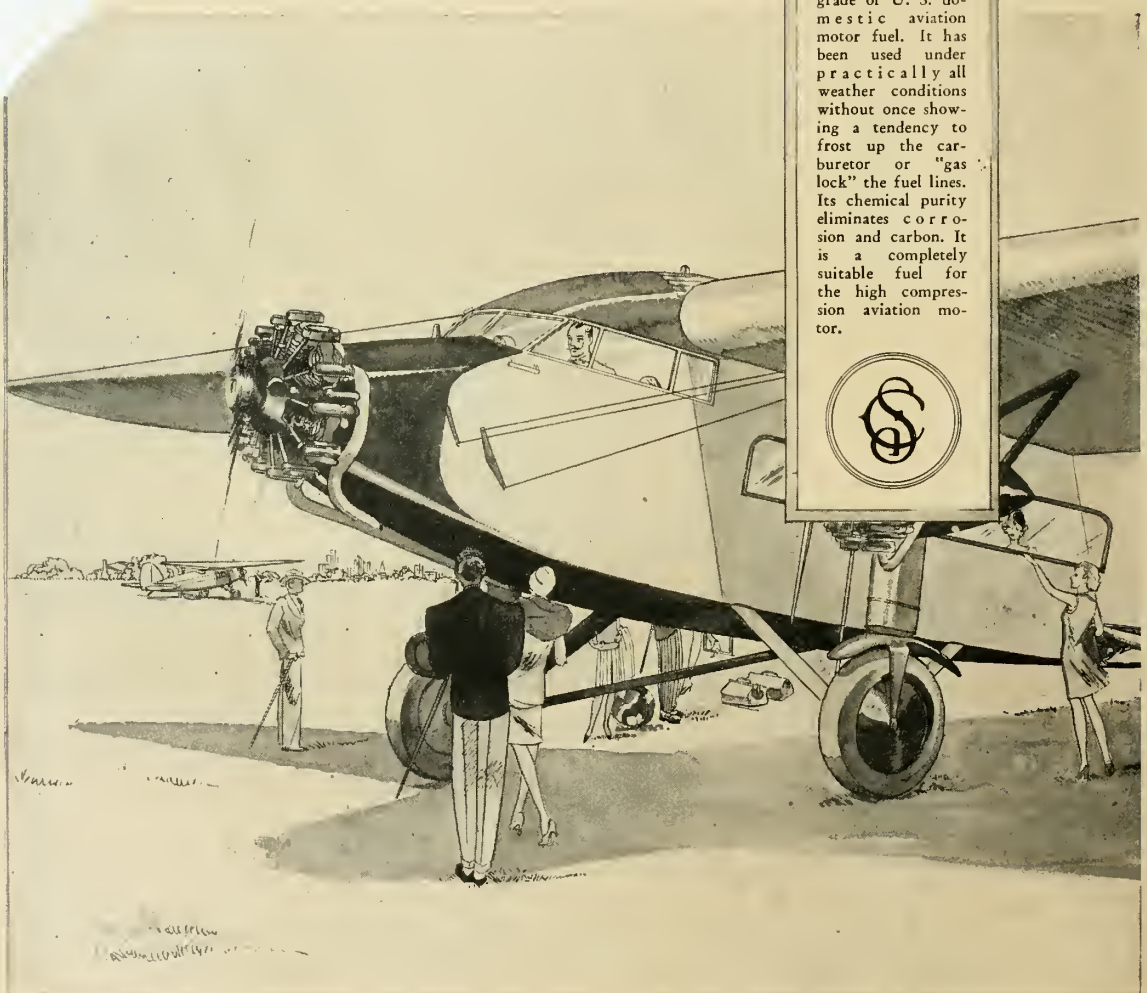
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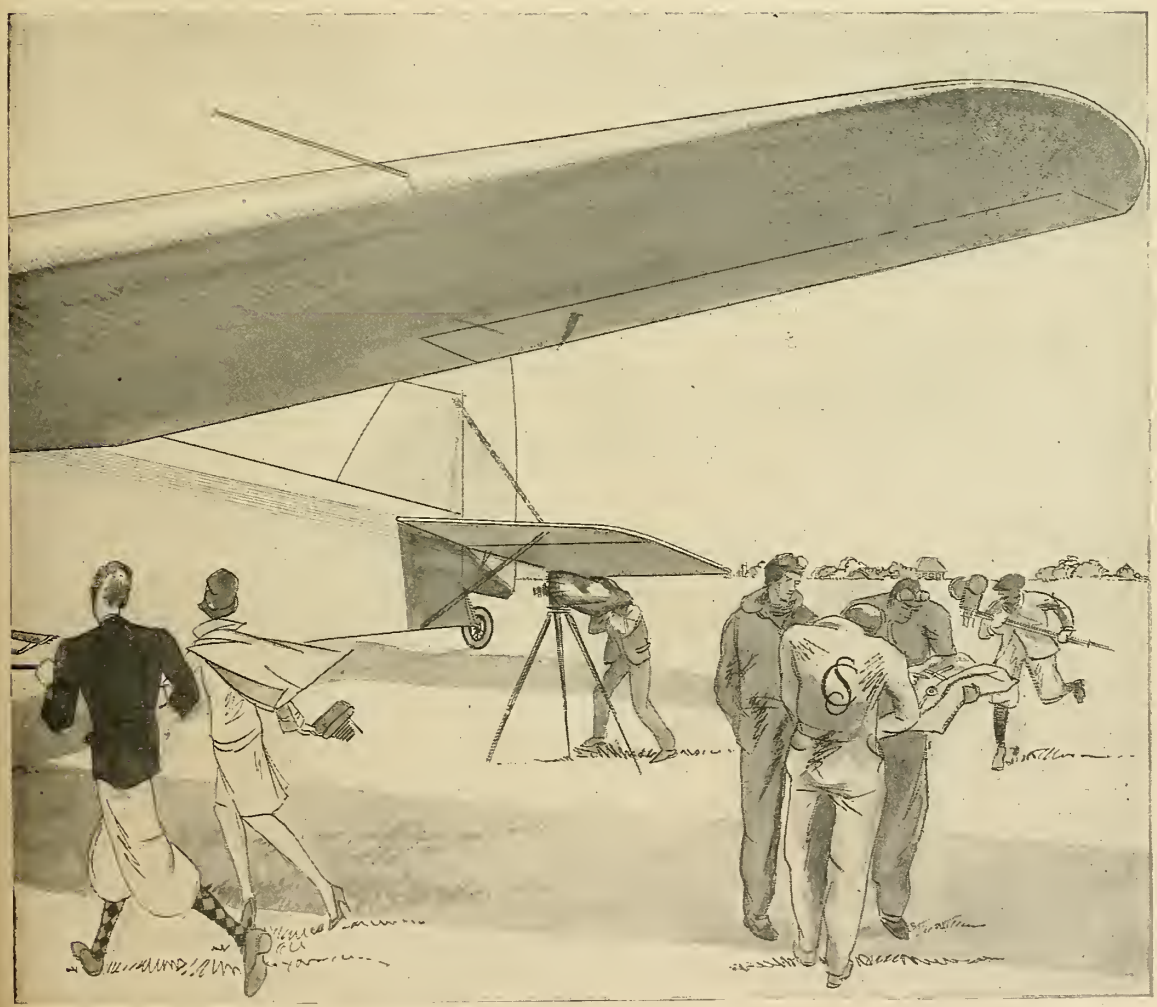
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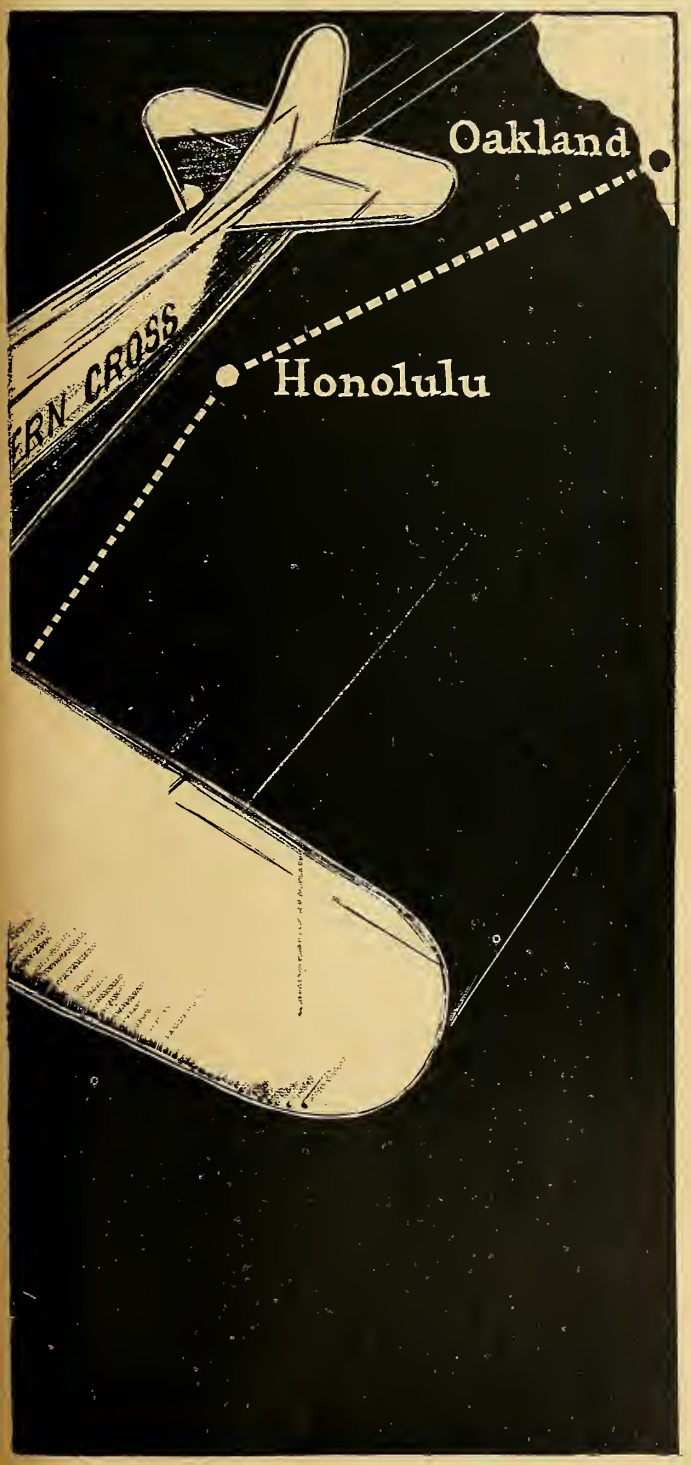


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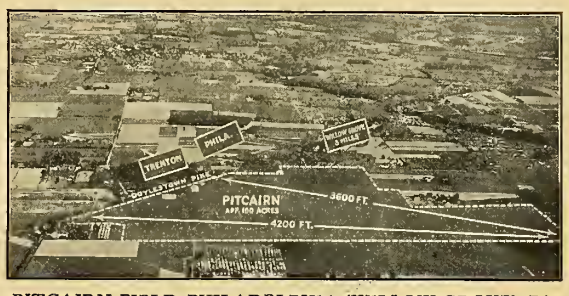
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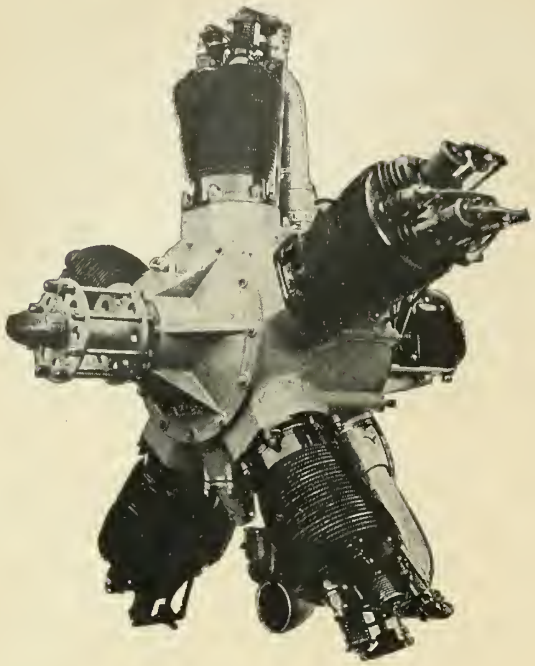
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Volume 13
No. 1

AERO DIGEST

JULY
1928

THE MAGAZINE OF THE AIR

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The Bulwark of our National Defense

AIR CORPS DEMONSTRATIONS

THE Army Air Corps, on May 21st, completed a very successful series of demonstrations of military air tactics. For the past few years it has been the practice to hold demonstrations at many of the Army schools where courses are provided for officers in the tactics of their respective branches and in the combined use of all arms. However, the rapid development of aviation has caused intense study and attention as to new methods and new measures, both for its full utilization as an air force and in connection with the offensive and defensive operations of military forces, and also as to means for protection against hostile aircraft.

Ground troops are experimenting in the adaptation of their normal weapons for use against aerial targets. Maneuvers now embrace practice in the detection of hostile aircraft and in a rapid dispersion to reduce the effect of hostile air attacks. Whereas prior to the World War troop movements seldom were made at night, now darkness is advocated for such purposes as a means of decreasing detection by hostile aviation.

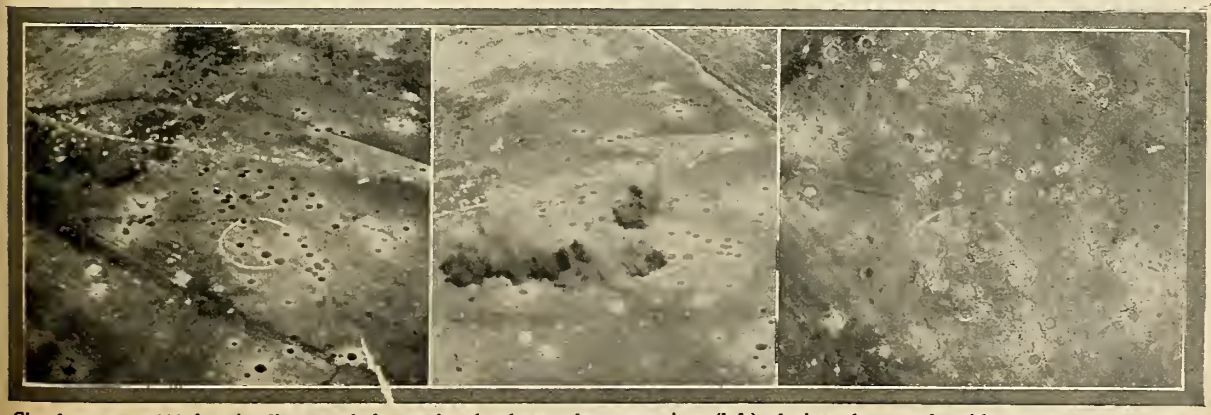
It therefore is apparent that the Air Corps today is subject of great importance to all military students, not only as to its strength and role in a balanced combat force of all branches, but also as to its effect on the methods employed by each of the other combatant branches, such as infantry, cavalry and artillery and the organization of installations in rear of an army.

The Demonstration Group commanded by Brigadier General Benjamin D. Foulois with a staff of eight officers was composed of a war strength attack squadron from the 3rd Attack Group stationed at Ft. Crockett, Texas, consisting of 23 airplanes and pilots, commanded by Major F. D. Lackland, and a pursuit squadron, also war strength from the 1st Pursuit Group stationed at Selfridge Field, Michigan. This squadron consisted of 26 pursuit planes and a like number of pilots under command of Major T. G. Lanphier. While for the purpose of these demonstrations, both squadrons involved were allotted their full war strength in planes and pilots, the number of enlisted men assigned to each was reduced to the minimum required to maintain the equipment, with such help as was available at the stations visited. The enlisted strength of the group was, therefore, only 85 men or less than one third of the war strength allowance. Each of the attack planes carried one enlisted man as observer. The remainder were transported in 14 Douglas C-1 and one Ford C-3 cargo planes. In addition to personnel these cargo planes carried several tons of supplies and equipment for the entire group, and effectively demonstrated the utility of the airplane as a medium of transportation on a large scale.

The troops comprising the Demonstration Group concentrated at Langley Field, Virginia, on May 1st, the Attack and Pursuit squadrons travelling by air from their respective stations and the Staff likewise travelling by air from Washington, D. C., Edgewood Arsenal, Md., and Wright Field, Ohio. On May 4th, augmented by a war strength bombardment squadron from the 2nd Bombardment Group which is located at Langley Field, the newly constituted provisional group staged a demonstration. The events of the demonstration included maneuvers of all types of planes and ranged from aerial combat, shooting down an obsolete observation balloon by pursuit planes, destruction of targets representing a battalion of Infantry by machine gunfire and fragmentation bombs from attack planes, laying of tactical smoke screens by pursuit and attack planes, and demolition of a simulated ammunition dump by the heavy bombardment planes, to a night flight in the evening by the bombardment squadron in perfect formation.

The following day the group proceeded to Ft. Bragg, N. C., where a similar demonstration was given on May 7th for the benefit of the Field Artillery Board which is located at that station and viewed by over 40 thousand spectators from every section of North Carolina and adjoining states. Many who had driven all through the previous day and most of the night expressed themselves as well repaid for the effort. Subsequent demonstrations were given at the following stations on the dates indicated: Infantry School, Ft. Benning, Ga., May 10th; Field Artillery School, Ft. Sill, Okla., May 16th; Cavalry School, Ft. Riley, Kansas, May 18th; General Service School, Ft. Leavenworth, Kansas, May 21st. Enroute between these stations stops were made at Montgomery, Ala., and at Monroe and Shreveport, La., at the invitation of the local chambers of commerce in order that residents of those vicinities might observe these units of the American air forces in action.

This was the initial appearance in large scale operations of the new attack plane which is equipped with five machine guns and can carry 250 pounds of bombs in addition to 2,600 rounds of machine gun ammunition. When engaged in battle these planes skim about 100 feet above the surface of the ground at better than 135 miles per hour. They rely for their safety solely on their speed and the suddenness and deadliness of their attack. Two guns are



Circular target 100 feet in diameter before a bombardment demonstration (left) during the attack with 300-pound demolition bombs (center) and its appearance after bombardment on May 4th.

installed in the wings and two fire through the propeller—all four including the bomb release being operated by the pilot. The remaining gun is installed on a flexible mount and is manipulated by the gunner in the rear cockpit.

Targets for ground attack were improvised to represent as nearly as practicable the types of ground troops employed at each of the stations visited. These targets were arranged in columns representing troops with their arms and equipment on the march and also deployed to an extent which was determined by actual test from 30 to 60 seconds after warning of approach of enemy aircraft. Wherever possible these targets were placed in wooded areas in order to simulate as nearly as possible war conditions and assuming that ground troops will naturally avail themselves of all opportunities for concealment from enemy aircraft.

The results in all cases were most gratifying to the Air Corps, heavy losses to the ground forces attacked being indicated in each situation assumed, even though the targets employed were not in all cases life size and in some instances, were laid flat on the ground. At Ft. Riley, Kansas, where mounted troops were represented by silhouette targets approximately life size and in the open 98 per cent hits were registered on a squadron of cavalry in column and 65.3 per cent on a similar squadron deployed 60 seconds after the warning signal had been given. As stated above the purpose of these demonstrations was not to decide the superiority of air forces over those of the ground, or vice versa, but to enable each force to observe the tactics of the other and thus enable them to determine the most effective methods of offense and defense against possible enemy forces of a like nature. This object was accomplished to the entire satisfaction of all concerned.

One of the outstanding features of these demonstrations was the clocklike precision with which each mission was performed and the total absence of delays, which speaks well for the discipline of the Air Corps and the expert direction of the operations officer, Major Carl Spatz and his assistant, Captain Frank O'D. Hunter. Brigadier General Frank Parker, Assistant Chief of Staff of the Army, and Chief of War Department Operations, accompanied the Group as official War Department observer. General Parker not only made the entire circuit by air in a tactical plane but was a passenger in one of the tactical planes in every mission, which was in itself an inspiration to the air troops. He paid a high compliment to their discipline and efficiency and expressed himself as having nothing but praise for the manner in which they had performed their duties and made the following report to the chief of staff:



A fine formation of bombers and pursuit planes laying a smoke screen during the Air Corps demonstrations.



Targets representing combat train at Langley Field (top); Cavalry targets at Ft. Riley, Kansas (center) and Infantry targets at Langley Field (bottom).

"It affords me great satisfaction to report that no incident of any kind occured to mar a smooth and efficient performance of duty by this air force from the beginning to the end of the expedition. From the cheerful, efficient mechanics, to the Squadron Commanders, I have to report a consistent excellence in discipline, technique and tactical maneuver.

"During this tour I have constantly flown in the exercises and have observed carefully, not only the technical efficiency of this air force, both as to the handling of the ships in the air and as to their maintenance on the ground, but have likewise given special attention to the matters of discipline of the personnel.

"I desire to commend the Flight Commanders, Majors Knerr, Lackland, Lanphier, and Coleman. The words of commendation of these Squadron Commanders is equally applicable to the personnel of their commands. The fact that there were no accidents and that all planes made this long trip and arduous exercises without accident is sufficient proof of the excellent work done by the mechanics.

"Finally, as to General Foulois and his able staff, I desire to express my admiration for the able and successful manner in which this very instructive air tour has been con-

(Continued on page 174)

THE BATTLESHIP BUBBLE

By Cy Caldwell

★ This is the first of a series of articles by Mr. Caldwell on the battleship as a weapon of national defense. Mr. Caldwell claims that the development of the bombing plane has rendered the battleship absolutely useless in modern warfare. From 1920 to 1928 $4,505,823,524.16 has been appropriated for the use of the Navy. Mr. Caldwell maintains that every dollar of the above sum, which has been spent in building or the maintenance of the battleship, has been a squandering of the people's money. These articles will be reprinted and placed in the hands of every Senator and Congressman in Washington, and reprints will be available for public distribution. — *The Editor.* ★

"IT seems comparatively easy for you to produce a satirical article on the Navy," writes a friend of mine, a former naval officer. "You give your readers the impression that the Navy is run by a crew of addlepated old women, that it is hopelessly inefficient, and that its weapons are obsolete. You convey that impression by the simple expedient of avoiding facts, and by embroidering your fancies in a pattern that amuses the reader and leads him to believe that you know what you are talking about—which I doubt very much. If you are capable of laying aside this attitude, and can set down in a serious way what you think is wrong with the Navy, I'll give your ideas consideration."

This attitude of which my friend complains was not forced upon me by lack of damaging facts pertaining to the obsolescence of the Navy as constituted to-day, but was dictated solely by my preference for writing in satirical vein. In this article I shall produce some of the facts on which I have based my opinions. And I want to state that if my opinions were expressed in lighter vein, they were not lightly arrived at; for I am intensely interested in the subject of National Defense, and am of the firm opinion that the taxpayers of these United States are paying for protection in event of war which the Navy of the United States, as now constituted, will be unable to provide. I believe, further, that the fundamental conception of National Defense, as it is enshrined to-day in the minds of the majority of the Navy's senior officers, is utterly unsound. They adhere to the belief that the backbone of the fleet is the battleship. That belief I consider fallacious. Now, if that belief *is* fallacious, the Navy's conception of Defense is wrong; and if it is *not* fallacious, then I am wrong. And if I am wrong, I want to know it; while if the Navy is wrong, *they should know it.* AND THE TAXPAYERS SHOULD KNOW IT.

But before I marshal the facts on which I have based my opinions, I must announce that I desire no one-sided discussion of this all-important matter. At my request, the publisher of AERO DIGEST offers the use of these columns to any competent naval authority who wishes to take issue with me and show me wherein I am wrong when I contend, as I do contend, that the Navy is not justified in its belief that the backbone of the fleet is the battleship—and not the airplane.

In this first article I shall confine myself to a consideration of the battleship itself, with special reference to its ability or inability to remain afloat under attack; and shall defer to a later article all discussion of the battleship's defensive and offensive power. Also, space limits preclude more than very brief reference to attacking forces, whether of sea or air, both of which will be discussed later. Therefore, anyone desiring to take issue with me at this stage of the discussion will kindly confine himself to the subject matter of this article—the ability or inability of a battleship to remain afloat under attack.

In his paper, "The Battleship and its Uses," awarded the 1926 prize of the United States Naval Institute, Hector C. Bywater states: "The modern battleship incorporates the ultimate degree of naval artillery power. It is at the same time the least vulnerable of all ships to this form of attack. It is expressly designed to deliver and to withstand harder blows than any other type of ship. Among surface craft it is admittedly supreme."

As it is admittedly supreme, there is no use in even considering any other fighting surface craft. For what explosion the battleship cannot survive, none of the lighter classes of ship can survive. The battleship is the only type of vessel carrying the heaviest vertical side armor; lighter and faster ships are not designed to carry the weight. Destroyers and light cruisers, for instance, have no side armor whatever. But let us examine a battleship and study "the least vulnerable of all ships" with special reference to the means taken by the builders to insure its remaining afloat; for should it fail to remain afloat under enemy attack its value as a weapon, whether for defense or offense, is exactly nil.

The most modern battleship is the English *Rodney,* completed a year ago. It has a displacement of 35,000 tons and a full load of 40,000 tons. It is 702 feet long, 106 feet wide, and draws 30 feet of water. It cost over $37,000,000 to build and equip, and will cost over $2,000,000 a year to keep in service. The guns and turret armor cost $15,000,000 and the engines cost $2,400,000. These engines of 45,000 h.p. can drive the ship through the water at a speed of 23 knots an hour—or at less than one quarter of the speed of a modern bombing plane. The armor belt along the sides of the ship is 14 inches thick, while that around the gun turrets is 11 inches thick. There are (supposedly) bomb-proof protective decks over ammunition magazines and engine spaces, although as these decks have not been tested in war by dropping large bombs upon them, the protection afforded by them is still matter for speculation. On the deck are huge armored turrets carrying nine 16-inch guns, twelve 6-inch guns, and some twenty smaller weapons. Beneath the deck are the engines and boilers, the fuel, stores, quarters for the crew, and vast quantities of ammunition which, war experience has demonstrated, is a constant and terrible menace to the ship. Instances will be given showing how ships were blown up by their own magazines, which stresses the point I purpose to make—that a battleship is an extremely vulnerable vessel, and that it carries within itself the means of its own destruction.

Such a battleship as the *Rodney* is a tremendous mass of metal floating upon the water. It has the appearance of great strength and solidity; and in that *appearance,* I am convinced, lies the peculiar hold upon the imagination that the battleship undoubtedly exerts. But how much actual strength and solidity does it possess? Here is the testimony of a naval expert, Mr. E. F. Spanner, of the Royal Corps of Naval Constructors (retired), Member Institution of Naval Architects, Member Institute of Marine Engineers, etc. In his excellent book, *Armaments and the Non-Combatants,* he states:

"A modern battleship is permitted by the Washington Conference to weigh 35,000 tons. To permit this vast weight floating upon the surface of the sea, close on one and a quarter millions of cubic feet of water have to be

displaced by the under-water hull. *This under-water hull is very little more than an enormous steel bubble,* divided up into a large number of separate bubbles by internal divisions within the outer skin. A bubble? It may seem a ridiculous thing to do to liken a battleship to so fragile an object as a bubble. But is it so ridiculous? The total under-water area of the hull of a modern battleship of 35,000 tons must be about 75,000 square feet or more. And the thickness of this tremendous expanse of steel skin? Take an ordinary box of matches between finger and thumb—finger on the top label, thumb on the bottom. The thickness of very little of that 75,000 feet of steel skin plating exceeds the thickness spanned by finger and thumb. To put the matter even more definitely, by far the greater part—say, over 75 per cent—of the outer skin of a modern battleship *is of steel no thicker than five-eighths of an inch."*

Taxpayers who have seen these huge fighting ships, for which they have paid $37,000,000, and who have heard so much about the 12 to 18 inches of armor plate around their hulls, have come, perhaps, to the conclusion that the bottoms and lower sides of battleships are, like the armor belt, at least a foot thick. Everything about a battleship *looks* so heavy. But actually most of the heavy armor is protection only against gun-fire, not even against torpedoes, *and certainly not against under-water explosions of large bombs.* "I have been astounded many times," continues Mr. Spanner, "by the extraordinary misconception there is among highly qualified engineers not connected with the sea, as to the thickness of the under-water hulls of sea-going vessels. I have many times found it a source of wonderment, sometimes even of outspoken disbelief, that the thickness of the under-water skin of a modern battleship should be no more than five-eighths of an inch. However, I have set the facts out plainly here. The match box test gives opportunity to visualize clearly the thinness of the skin on the intactness of which the battleship depends for her ability to remain afloat. Is it so much amiss to liken the hull to a huge bubble?"

To my mind, it is not amiss so to liken it. Mr. E. F. Spanner, a recognized authority on naval construction, has put this and other naval matters so clearly, that his book, *Armaments and the Non-Combatant,* should be in the hands of every head of a Bureau in the United States Navy. It also would make a very useful text-book for the Naval Academy. And every member of the Senate and House Naval Affairs and Appropriations Committee should read it.

When we understand just what a battleship is, it is not difficult to see how General William Mitchell was able to sink the ex-German battleship *Ostfriesland* with such remarkable ease in the American Army-Navy bombing tests, even with the equipment which he had in July, 1921. The *Ostfriesland* was a first line ship of 22,440 tons—a ship of the *Dreadnought* class, and a very fine vessel. After some preliminary bombing with small bombs to observe their effect, the order was given to drop the 1,100 lb. bombs, one at a time. I quote from "Winged Defense" by General William Mitchell: "Two of these bombs hit alongside and three hit on the deck or on the sides, causing terrific detonations and serious damage. Fragments of the battleship were blown out to great distances. Immediately the Navy Control Vessel made frantic signals for the attack to stop. Lieutenant Bissell had turned his flight and was ready to finish her, as he had five additional bombs left. He had injured the ship so severely that if she had been equipped with her crew, her ammunition, and had had steam in her boilers, she probably would have been destroyed. That night she listed so badly that 2,000 tons of water were let in on the other side to keep her straight up so that she would not roll over."

The bombers returned to Langley Field, and went out next day with their 2,000 lb. bombs. General Mitchell continues: "The great ship was down a little by the stern, drawing about 40 feet of water; she had sunk considerably after Bissell's attack on the preceding day. Four bombs hit in rapid succession, close alongside the *Ostfriesland.* We could see her rise eight or ten feet between the terrific blows from under water. On the fourth shot she was gone. When a death blow has been dealt by a bomb to a battleship, there is no mistaking it. Water can be seen to come up under both sides of the ship; she trembles all over, and she usually rises in water, sometimes clear, with her bow or stern. In a minute the *Ostfriesland* was on her side; in two minutes she was sliding down by the stern and turning over at the same time; in three minutes she was bottom-side up, looking like a gigantic whale, then gradually she went down stern first. In a minute more only the tip of her beak showed above the water. It looked as if her stern had touched the bottom of the sea as she stood there straight up in a hundred fathoms of water to bid a last farewell to all her sister battleships around her. She slid to her last resting place with very little commotion. Thus ended the first air and battleship test that the world has ever seen. *It conclusively proved the ability of aircraft to destroy ships of all classes on the surface of the water."*

I call special attention to General Mitchell's remark regarding the damage inflicted by the first smaller bombs, which "injured the ship so severely that if she had been equipped with ammunition and had had steam in her boilers, she probably would have been destroyed." For proof of which we must turn to the last war, in which aircraft were not used against battleships. But while we can give no results of bombs, the action of big shells — *which is considerably less than that of large bombs* — affords us data on which we may base the probable effect of huge bombs in



A patch covering a hole 78 by 47 feet on the hull of the Alabama.

the next war. The following account of the loss of the 27,000 ton British battle cruiser, *Queen Mary,* proves that a ship in action carries within herself the certain means of her own destruction, with only contributing cause by the enemy's fire. This occurred during the Battle of Jutland, where for some minutes the *Queen Mary* had come under the concentrated fire of the German battle cruisers *Derfflinger* and *Seydlitz*—18 guns against 8 at a range of 15,000 yards. I quote from "Battleships in Action," by H. W. Wilson, eminent naval historian, to whose valuable work I am indebted for many quotations:

"Between 4:24 and 4:26 P. M., May 31, 1916, the *Derfflinger* fired six salvoes (or 24 12-inch shells) which straddled the *Queen Mary.* From neighboring ships it was seen that at least three shells hit her forward and a brilliant flame shot up from her hull. Immediately afterwards a salvo hit her amidships, near Q turret, which had already been heavily hit, and this salvo was followed by dense clouds of smoke and brilliant flame. Masses of steel with incredible quantities of paper were blown into the air and along with them a boat turned upside down. The roofs of her turrets were projected upwards to a height of 100 feet. A column of smoke shot up to an enormous height—1,000 or 1,400 feet—mushroom shaped and intensely black. As the column of smoke sank, the *Queen Mary* disappeared; the stern part of the ship was the last to go with propellers still revolving above the water and men crawling out of the after turret. It vanished in a great final explosion."

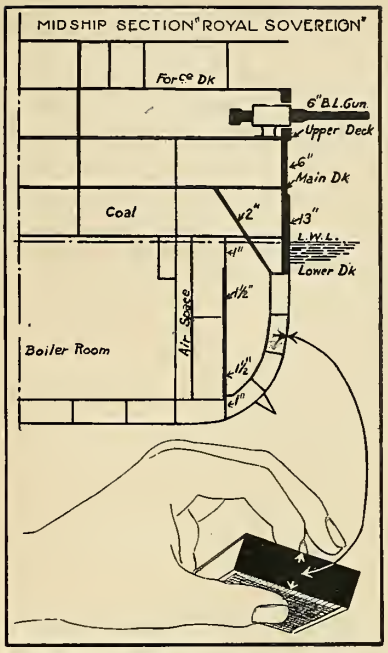


Diagram of a modern battleship illustrating the thickness of the skin below the water line.

All this in perhaps a minute! While the ship was hit by 15 or more projectiles, it is probable that they would not have sunk the vessel—certainly not in a minute. What happened was that the *Queen Mary's* own ammunition had exploded, blowing the bottom out of the ship. General Mitchell knew very well to what danger he was alluding when he mentioned the extra hazard of a ship actually in action. The danger of ammunition explosion aboard a vessel being heavily shelled or bombed is, in my opinion, at least equal to that of armor or hull penetration. Yet we seldom hear mention of it, because in most of the discussions of airplanes versus battleships the talk centers on the resisting power of the ship's armor and double sides, and the supposed ability of the ship to survive with several damaged compartments—which we will take up later in this article. But personally I am of the opinion that the action of large bombs on the engines, boilers, and ammunition magazines of the warships will be quite as deadly as the action of underwater detonations.

If the explosion of the *Queen Mary* was an isolated instance, it would not support my contention adequately. But the last war offers several instances, among others that of the *Black Prince,* an armored cruiser of 13,600 tons. In the Battle of Jutland, at midnight of June 1, the *Black Prince* approached the German line, evidently mistaking it for British. Mr. H. W. Wilson writes: "At a range of 1,000 yards the *Thuringen, Ostfriesland, Nassau* and *Friedrich der Grosse* opened on her an appalling fire; some ten heavy shells from the *Thuringen* struck her at the closest range in the first minute. Flames rose from her shattered hull high as the masthead and lighted up the work of destruction. Not a shot could she fire in reply. A roaring furnace, she drifted along the German line with explosion following explosion, till there came a fearful detonation and a column of fire rose to an enormous height in which she and all her crew perished." The terrible German fire would of itself have been able to sink this fairly old ship in a very short time, but what actually sunk her was the explosion of her own ammunition—magazine after magazine, ignited by the German shells.

Another instance of ammunition fire is afforded by the battle cruiser *Lion,* sister ship to the *Queen Mary.* In the same battle, says historian Wilson: "A shell from the *Lutzow* struck Q turret amidships, perforated the armor, and burst inside, killing or severely wounding most of the officers and men in the turret and working chamber. Major F. W. Harvey, in command of the Marines working the turret, was mortally wounded, but in the hour of death he gave orders to close the magazine doors and flood the magazines. Fire smouldered in the turret among the dead and dying, and in the heat of battle it could not be reached nor could the turret be cleared. Presently it caught the ammunition in the turret and trunk hoists; a great rush of flame arose from the *Lion* amidships to a height of 200 feet, but though all save two men in the turret and nearby compartments perished, *the ship was saved by Harvey's heroic act, which was honored by a posthumous V.C."*

There is no doubt in the mind of the historian that the *Lion* would have gone as the *Queen Mary* went, had Major Harvey not flooded the magazine—thus preventing the great store of ammunition from exploding and blowing the ship to pieces. For no ship yet built, and no ship that ever can be built, will survive an explosion of several hundred tons of ammunition—which easily could be detonated by the largest aerial bombs, protective decks or no. The entire bottom of the ship near the exploding magazine—a double bottom of steel plates, each no thicker than a match box—would be blown out. And the ship would sink in a matter of seconds. Wilson says, "In the *Lion* a considerable part of the top of Q turret was blown clean off by the heavy German shell, which caused the bad fire in that turret and *all but destroyed* the flagship of the Battle Cruiser Force." The *Lion* had received practically no damage below the water-line, which it undoubtedly would receive from large aerial bombs. Yet only the heroism of a dying man prevented that 27,000 ton battle cruiser from going to the bottom—a ship so vulnerable that *it is dependent on the action of one man whether it stays afloat or sinks with all on board!*

When I mention battle cruisers in this article the reader is not to assume that I am discussing ships necessarily of less armor or armament than battleships. For instance, the American battlesehip *Arkansas* carries amidships armor of 11 inches, and carries as its largest weapons 12 12-inch guns; while the British battle cruiser *Hood* carried 12-inch armor amidships, and has 8 15-inch guns; and while the displacement of

(*Continued on page 180*)

THE FLIGHT OF THE "SOUTHERN CROSS" FROM CALIFORNIA TO AUSTRALIA

By Francis D. Walton

THE task left undone in the very busy season of spectacular flying of 1927—the crossing of the Pacific by air—was accomplished in the opening days of last month in a refreshingly unspectacular manner by four men who seem to have undisputed claim to the title of the "Best Flight (so far) of 1928." The achievement of Captain Charles Kingsford-Smith and his three companions, as much for its manner of execution as for its pioneering quality, slips easily into a prominent niche in the hall of flying fame among the greatest flights of all time.

Flying the tri-Wright Whirlwind-engined monoplane *Southern Cross,* Captain Kingsford-Smith, Charles T. P. Ulm, his co-pilot, Lieut. Harry W. Lyons, navigator, and James Warner, radio operator, crossed the Pacific in eight days, seven hours and thirty-five minutes from the Oakland, Calif., airport to Brisbane, Australia. The actual flying time for the total trip of 7,347 miles, which included the longest flight ever made in a plane over water, was 83 hours and 35 minutes. From Brisbane the *Southern Cross* later flew 500 miles to Sydney where it was announced that the flight would be continued around the world. G. Allen Hancock, of Los Angeles, is the financial backer of the flight.

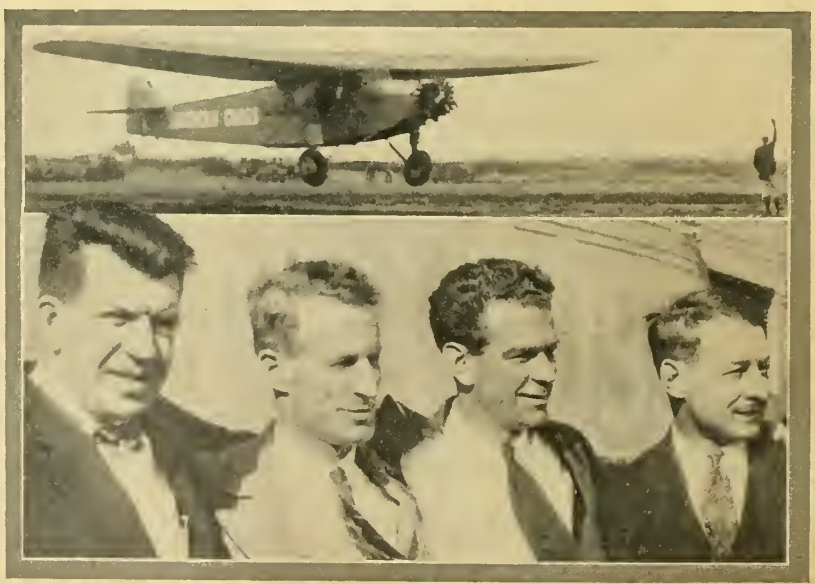
Peerless flying was maintained on all three legs of the flight. The hop from the Pacific Coast to Honolulu was accomplished with an efficiency which brings back to mind the Army-Hawaiian flight of 1927 made by Lieutenants Maitland and Hegenberger. The distance was 2,408 miles, and was made in 27 hours and 27 minutes of flying time at an average speed of 88 miles an hour. The second leg from the Hawaiian group to the Fiji Islands, a distance of 3,144 miles, was made in 34 hours 33 minutes at an average speed of 91 miles an hour. Suva to Brisbane was 1,795 miles and was covered in 21 hours and 35 minutes at an average speed of 83.5 miles per hour. On the last leg the fliers encountered headwinds and an annoying series of line squalls which somewhat reduced their flying speed. The only delay in the flight schedule was at Suva, when the *Southern Cross* had to wait for a supply of fuel to be delivered by a steamer, a form of surface craft still used in certain parts of the Pacific, although during their brief stay in the Fiji Islands, Ulm and Warner taught the natives to say, "It won't be long now," which, it is understood on good authority, has nothing to do with any future plans that the navy might have.

After a run which Captain Kingsford-Smith admits was sufficiently long, the high-wing bulk of the *Southern Cross* was lifted off the runway of the Oakland airport on the morning of May 31. The start was made after a thorough period of testing. The carefulness of the preparations made for this flight is both a contributing factor to the success of the undertaking and a tribute to the captain and his aides.

The *Southern Cross* was a smooth working ship when it headed out over the waters of the Golden Gate on the last day of May. Any kinks which she may have had, had been worked out in the series of attempts made last winter to establish a new world's duration record with the plane. The fact that these attempts were unsuccessful was not so much a discredit to the rebuilt plane as it was proof that the record is a theoretically impossible goal for a large trimotored plane.

"O. K. Everything going fine!" one of the first radio messages sent back by Warner, was the keynote upon which the success of the whole flight to Hawaii was pitched. No trouble of any kind was experienced in the first stage of the undertaking, unless one counts in that easily forgiven feeling of doubt which creeps in during what is most apparently the last hours of the flight, and the islands just refuse to show on the horizon. The feeling of uneasiness did not decrease for the flying quartet when they began to see mountain ranges which later turned out to be mirages. The *Southern Cross* did not carry among its extremely complete complement of instruments a flowmeter, and Warner's messages on June 1 told a story of fear that the plane would run out of gas before the islands were reached. Yet when the *Southern Cross* finally landed at Wheeler Field there were some 190 gallons of gasoline still in the tanks. The *Southern Cross* left Oakland with a fuel load of 1,160 gallons.

An even greater load had to be carried to get the plane over the next stage of its trip. The fuel supply for the longer hop to Suva was 1,290 gallons. In order to increase the safety margin at the take-off, the plane was removed from Wheeler Field before loading and taken to the Barking Sands runway at Kauai, Hawaii. Here the fliers found a take-off



International Newsreel.

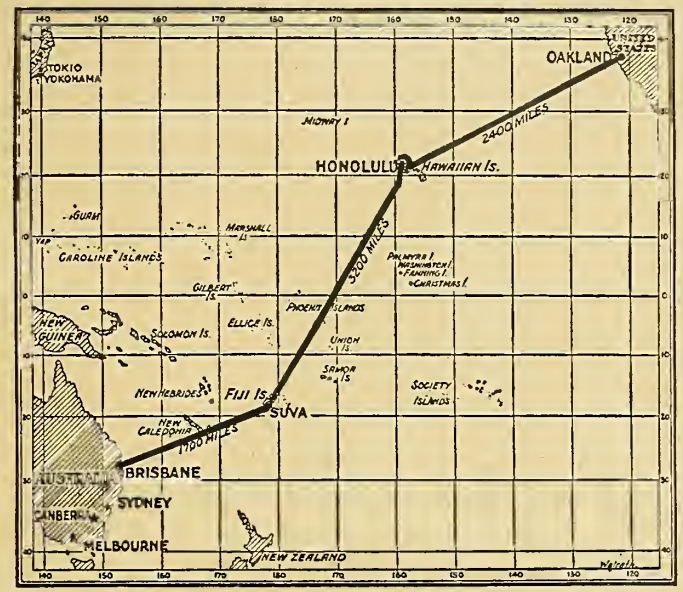
Lieut.-Com. Lyon, Captain Kingsford-Smith, Captain Ulm and James Warner

stretch 4,500 feet long, which to the great surprise of everyone only a little more than half of it was needed to get the plane on its way again. This was on the morning of June 3. The take-off time was 7:50 a.m. Pacific time.

Although Warner and Lyon had demonstrated amply in the flight to Hawaii that their respective contributions in radio operation and navigation were invaluable, it was in the making of the flight from Barking Sands to Suva that they demonstrated their real worth to the expedition.

Lyon found at hand in the *Southern Cross* a set of instruments which for completeness had had no peer anywhere in any plane. Besides standard instrument equipment, the *Southern Cross* carried an earth inductor compass, three magnetic compasses, an aperiodic compass, a radio direction finder and several types of sextants.

A word might be said about the radio direction finder. When it worked it seemed to work well. But there were times when the fliers were unable to find the signals, and it would appear that this flight once again demonstrates that in the radio direction finder man has gotten hold of something which is still a little elusive, which in its present stage of development can be dismissed with the words, "When it works, it's swell; when it don't, it just ain't."



From the New York Times

Map showing route of the first trans-Pacific flight

Not the least remarkable phase of the crossing of the Pacific by air was the fact that throughout the entire time of the flight the plane was in constant touch with the rest of the world by radio. More than any other feature, the radio work of Warner served to remove from this flight that sense of desperate dash from pillar to post which marked most of the spectacular flying of 1927.

The *Southern Cross* is a hybrid ship rebuilt mainly from two Fokker planes which formed the aircraft equipment of the Wilkins Arctic Expedition of 1926. Captain Wilkins in February, 1926, bought a single-Liberty-engined Fokker and a three-Wright-engined Fokker for his Arctic expedition. The two planes were flown considerably in Alaska, but when the expedition was abandoned the ships were dismantled and shipped back to Seattle.

After being stored for some time in the factory of the Boeing Aircraft Company at Seattle, Boeing engineers went to work on the dismantled material and the result was one new high-wing, cantilever monoplane. This is the ship that later was named the *Southern Cross*. The fuselage of the single-engined plane and the large veneer wing and the landing gear of the tri-motored plane were used in the rebuilding. The plane was flown for a time with the three Wright engines which powered the original large machine, but this power unit was later replaced with three new Wright engines, the performance of which appears to have been perfect throughout the entire Pacific flight. The average fuel consumption was at the rate of about 11½ gallons per motor per hour.

The rebuilt plane has a welded steel tube fuselage and welded-steel tube control surfaces, with the exception, of course, of the ailerons, which are of wood. The wing spread is 72 feet, and 8 inches. The maximum chord is 14 feet; the overall length is 47 feet; and the wing area 742 square feet.

Performance statistics given to Kingsford-Smith when he took over the plane gave the plane a high speed of 122 m.p.h.; a cruising speed of 100 m.p.h.; landing speed 55 m.p.h.; a climb at sea level of 720 feet per minute and a service ceiling of 12,500 feet. At the take-off at Oakland, May 31, the plane loaded weighed 14,400 pounds.

The long distance flying of last year in which radio was carried seemed to demonstrate that radio and aviation just would not mate. The more observant persons were inclined to believe that this was not so much a mechanical as a human fault. An ability to operate radio was used by almost anyone as an excuse to become attached to a trans-oceanic expedition, and the result was that during most of the flights the radio equipment was idle.

Rain storms and generally bad weather were encountered by the fliers as they forged across the Equator. On the flight to Suva Captain Kingsford-Smith and his companions had the reassuring factor of a series of tiny coral islands, which in a future day of regular plane operation in the Pacific should prove an invaluable aid in boosting the safety factor. In dodging the storm areas and fighting their way up to higher altitudes the plane consumed an unexpected amount of its fuel supply, and again in the last hours of flying on this leg there came messages of misgiving from Warner that the gas might not hold out. But this fear was without real foundation, and at 6:23 Pacific time on June 4, Captain Kingsford-Smith brought the *Southern Cross* down to a happy landing at Suva.

There was still a flight of 1,795 miles ahead of the fliers before they would reach the mainland, but this proved a mere romp for Kingsford-Smith and his companions. There were a few tough moments on this stretch and the headwinds were bad all the way, which greatly reduced the flying speed for the trip. And after Brisbane, the *Southern Cross* flew with ease the 500 miles to Sydney, where announcement was made that the flight so auspiciously started would be continued on around the world.

This epochal journey has also an international aspect for Captain Charles E. Kingsford-Smith, commander and chief pilot, and Captain Charles T. P. Ulm, his assistant, are Australians; Lieutenant Commander H. W. Lyon, Jr., navigator, and James W. Warner, radio operator, are Americans. The four are World War veterans. Their flight brings two of the world's youngest "colonies" weeks nearer each other.

AIR—HOT AND OTHERWISE

A National Asset
A Washout
A Nigger in the Woodpile

By Frank A. Tichenor

WITH the passing of the first session of the Seventieth Congress one very evident truth was demonstrated which was that in the House Military Affairs Committee flying had a champion during the entire session.

Every day in every way, long after Congress had adjourned and other Congressmen were participating in the pleasures of Washington (if any) that champion in the House, the Hon. Frank James, was at work upon this comparatively new and, to the best interests of the nation, very vital interest. Thus the Twelfth Michigan District gave to the American nation a servant who not only was good and faithful, but one who was enterprising, progressive-minded and intelligent. There is nothing of the stodgy statesman about Frank James. He looks ahead and has the mental eye to do it with.

Congressman James, as a member of the House Military Affairs Committee, has realized his duty; and as the acting chairman of that body, during the last two years, he has given his entire time, virtually, to the important work involved. He has studied the various problems put up to it earnestly and intelligently.

Congressman James is high speed, multi-engined and fully equipped with a radio direction finder, together with all other of the most modern intellectual accessories. To an ordinary human being like myself it seems scarcely possible that one human mind can conceive or one human body achieve as much as those of Frank James have during his brief term in office. Not only has he mastered and fought for the best interests of all the air services, but he has become thoroughly informed with regard to the needs of the Army as a whole, and done immense things for it, giving it new, good housing, and in some details, reorganizing it. A chronological summary of his efforts and achievements, might wake the voters up to the fact that in this man they drew a real prize from the political grab bag.

No man outside the Army, and probably no man within it, knows the conditions and needs of its posts and flying fields as he does, for he has visited every one of them with the intention of discovering exactly who is who, what is what and why is why. He knows our military facilities from the gas tanks of our flying fields to the cell cots in our military prisons as far as subject matter goes, and from Porto Rico to Hawaii as far as geography goes. He has studied our instruments of warfare from the service revolver to the biggest guns of coast defense and our vehicles of combat from the Doherty Wagon to the airplane, preferring planes to Doherty wagons, even though the latter be accompanied by the inimitable Army mule. From Hawaii he was impelled to hurry back to the home nest, because the Army mules there made him homesick for a sight of Congress and a glimpse of its activities. During his tremendous journey of inspection he did much flying—flew everywhere and every time he could, in fact.

In our recent history, therefore, we have had no Congressman as well prepared with personal knowledge of the matters upon which he specializes as is the Hon. Frank James. On nearly every matter appertaining to the Army he is by far the best informed man in our public life, and this solid, expert knowledge makes him a great friend of the flying forces.

The Hon. Frank James will be the best friend that the air services could have because, to mention one good reason, he has shown himself to be the best friend that the Army ever had.

What Mr. James has done for Army housing makes a magnificent record of achievement as things stand today and he has by no means finished this good work.

The improvements which have been authorized for Army housing will do much to save the informed people of the nation from the bitter shame which has affected them for several years when they have thought about this subject.

Flying fields have been allotted money for equipment, largely because of Mr. James' efforts. At Albrook Field, Panama, for instance, barracks for enlisted men will cost $560,000, quarters for 111 married noncommissioned officers will cost $539,000, quarters for commissioned officers will cost $778,000. This gives this new flying field its first permanent construction.

Smaller appropriations, but adequate, provide for improvements of a similar nature at France Field, the other new field in Panama. Wheeler Field, Hawaiian Department, has been authorized and will be adequately equipped with housing and other facilities; Bolling Field, at Washington, is to be extended and developed, its first permanent construction to cost $906,000; Chaffee Field, in Illinois, gets $220,000 for barracks and officers' quarters; Crissy Field, California, has had money set aside for permanent improvements totalling over $300,000; Langley Field, Virginia, gets $2,135,160. March Field, California, gets $569,500; Maxwell Field, Alabama, gets $580,000; Mitchel Field, New York, will be made available in the best sense by the expenditure of $1,713,000; Rockwell Field, California, will get $776,000; Scott Field, Illinois, a new field, gets $160,000 for its first permanent construction; Selfridge Field, Michigan, gets $1,967,400 for permanent construction, including $100,000 for a hospital.

The Army fliers, therefore, will be among the most notable beneficiaries of the new though long overdue Army housing program and may thank Congressman Frank James for it.

In connection with all this progressive work in connection with Army Building program, it is well to mention the fact that Congressman James also has devoted much thought and effort to the interests of the civilian army of this country, being fully aware not only of its needs in the air but of its needs on the ground. The successful operation of the National Defense Act during the ten years since the war have greatly pleased him, as they have pleased all who by circumstances have been made familiar with them.

He is distressed over the misapprehension of National Guardsmen as to the plan for a Reserve Army which have been worked out and will be re-laid before the next Congress. These misapprehensions seem to center around the idea that the Reserve Army is intended to supplant the National Guard. As a matter of fact our Reserve Army, organized into tactical units allotted to the various corps areas on the basis of population and administered by the Corps Area commanders, contains no enlisted men other than noncommissioned officers, but comprises 111,000 officers, living in every part of the country and serving without pay except when actively in training for two weeks during the summer. Their service, therefore, is purely patriotic, and, of course, often is rendered at considerable personal expense and great (*Continued on page 174*)

FIRST SEAPLANE FLIGHT TO EUROPE

THE first seaplane nonstop flight across the Atlantic Ocean and incidentally the first transoceanic flight ever made successfully in which a woman was a passenger started from Trepassey Bay, Newfoundland on the morning of June 17 in the face of unfavorable weather warnings and after several abortive attempts. The plane, a trimotored Fokker monoplane of conventional design equipped with extra size duralumin pontoons made by the Junkers corporation at the Dessau, Germany plant, had been thoroughly tested, first by test pilots of the Atlantic Aircraft Corporation at Teterboro Airdrome, Hasbrouck Heights, N. J., and again by Wilmer Stultz who flew the plane on the long hop, from the waters of Boston Harbor off Squantum, Mass.



Wilmer Stultz

Miss Amelia Earhart

Wide World photo

Lou Gordon

Built originally for Commander Byrd to use on his South Pole Expedition the plane was turned over to a company formed for the purpose of making a transatlantic flight with a pontoon equipped plane backed by the Honorable Mrs. Frederick Guest, wife of Captain Guest, former British Secretary of State for Air. Mrs. Guest had planned to make the flight herself, but circumstances arose which made this impossible and through the American publisher, George Palmer Putnam, Mrs. Guest arranged to have Miss Amelia Earhart, Boston social service worker, and amateur flier with more than 500 hours solo to her credit, to take her place in the plane. Miss Earhart planned to take the stick herself during the flight, but conditions over the Atlantic were far from suitable for an amateur flier, inexperienced with big planes.

Stultz was at the controls during the greater part of the crossing, leaving them to Louis (Slim) Gordon, mechanic and emergency pilot, while he worked the radio. Miss Earhart spent her time in the after cabin behind the big gasoline tank except for brief periods when because of the cold she crawled forward to the dual control cockpit for warmth.

From the scattered and meager data available at this time, three things stand out in this particular flight. First, perhaps, in the order of importance is the repeated vindication of the suitability of multimotored planes for such an expedition coming as soon as it has upon the heels of the trimotored Fokker flight to Australia. Second, the clear substantiation of the theory of meteorologists that east winds and low pressure at the surface does not necessarily mean prevailing east winds higher up. As soon as the lessening weight of the big ship permitted Stultz pushed it first to 5,000 and then as high as 11,000 feet. The *Friendship* made *(Continued on page 173)*



The tri-motored Fokker monoplane "Friendship" starting on the flight to Europe. *Wide World photo.*

AERO DIGEST

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AMERICA'S (D)EARHART

THREE cheers for Amelia Earhart. Her first name is Amelia. If D. were her initial it would, in combination with her surname, express about the feeling which aviation ought to have for her. If Mary Pickford is every motion picture fan's sweetheart Miss Dearhart (beg pardon, Earhart) is aviation's positively best girl.

She not only tried it but she did it.

It is not inaccurate to make some comparison between her and Lindbergh. She made her preparations quietly, as he did. She was out to do it as he was and if she did not do it quite as well as he did, she still did it mighty well, at that. AERO DIGEST is delighted to remark that it is absolutely for Amelia.

ANOTHER JOB FOR THE INDUSTRY

WASHINGTON, in any of its official branches, cannot be expected to know things about aviation automatically. The public generally is without a magic road to flying knowledge.

There should be a fully competent Bureau of Information at the national capital and the industry as a whole should organize and support it, seeing to it that it is 100 per cent competent.

If the public utilities people can spend the millions that we know they spend in this and other ways, it is evidence not only that such measures are necessities but that they pay.

Under existing circumstances the aeronautical industry and enthusiasts generally will find it very profitable to organize for protection and promotion. The whole movement toward developing American aviation automatically arouses wrath in certain quarters. They'll fight. We must be able to fight back.

And above all we must be ready with the facts in Washington to nail any lie, correct any error that may be told or threatened through perversity or ignorance, if it is even remotely likely to do harm to aviation.

MEDALS

PERSONALLY we have our doubts about the medal as a means of proving human gloriousness, but lots of people like to have them and others like to give them. They have been very generally bestowed upon distinguished fliers lately in America. But Clarence Chamberlin is short just one, although he certainly earned one bright and splendidly beribboned. The Distinguished Flying Cross. If we can hide with American metal the chests of two Germans and an Irishman, we ought to be able to do something for this splendid American aviator.

Some think that the snub of Chamberlin is due to an unwillingness to glorify Levine. Well, no matter what some people think, we are a big country and a little actual generosity wouldn't hurt a mite. It is true that Levine rode in with Chamberlin, but there is this to be remembered—he rode in—all the way in. A medal to Levine won't hurt us; and it really will be a vicious mark against us if we do not give one to Chamberlin.

FAKE FLYING SCHOOLS AND CLUBS

ONCE more we are moved to write about fake flying schools and so-called flying clubs. Throughout the country they are springing up, incompetent to give instruction, without standing among actual fliers, conducted by unpatriotic hijackers endeavoring to cash in on the wave started by brave and earnest men whose fine achievements have stirred a justifiable national enthusiasm.

Every effort must be made by those really interested to direct attention to the crookedness of every such fake effort. Authorities of all sorts, professional, civil, and, perhaps, criminal, should be kept informed. Such bunco steerers should be warned and then, if they persist, hoosegowed.

For months we have been studying this problem, but it is impossible for us to cover the whole United States. These poisonous weeds, which will give good flying indigestion if they are not cleared from the pasture, are springing up in every corner of the national lot. They are as bad as crooked gold mine stock or mushroom radio promotions. In many cases the old swindlers who got their training in those lines are now working this new one. Watch out and tell your friends to tell their friends to tell THEIR friends to yell for help or shoot when one of these contemptible burglars seems to be approaching.

There are good clubs and splendid schools, the latter both of the direct flying class and of that offering correspondence courses. They should be encouraged. They are making actual fliers and building markets for the manufacturers' aircraft production. They will be of value to the national defense if needed.

But these others—they are bloodsuckers and leeches. They should be exterminated.

AERO DIGEST will coöperate with anyone, in the industry or elsewise, honestly interested in flying, who learns of such a vicious enterprise, no matter where it may be located, and try to see that it is put out of business and its crook promoters punished to the limit of the law.

A DANGER TO THE INDUSTRY

AERO DIGEST has a certain fear that among the leaders of the industry are a few whose tendency toward stock-manipulation recently has been absorbing too much of their attention. This is a bad sign, and history shows it. Stock manipulations undoubtedly very seriously hampered the development of American railways at one time. While such operations are fine for the people who win, they are bad for the people who lose, and always the latter are in the majority. Inflation never has been of general benefit to any large interest.

The men who have been the biggest winners in this recent movement have been among those who from the beginning have been the greatest beneficiaries of the industry and who should most earnestly have its interests at heart. They easily might upset it by over-promotion. Enough of that will be done by the fakers. For its really important men to discount the future of an industry is always a dangerous thing, for it invariably means that the ignorant investor, misled by two rosy promises, will lose instead of gain and when that happens will be transformed from a booster into a knocker. Any knocker can do harm enough in a day to counterbalance all the good that a dozen boosters can do in a month.

Nature's law demands that what goes up above its natural level must come down, even though that natural level may after the episode be established at a point somewhat higher than that at which it originally stood, and speculative ups and downs bring the wrong kind of money into the game which needs not speculative cash but solid investment.

THE BIG BALLYHOO

By Don Rose

THERE'S another letter here from Mr. James McNutt. You remember maybe, that we heard from James some months ago, and that the perpetrator and proprietor of this monthly indiscretion had his reasonable doubts about a gentleman of that name actually residing in a town named Brazil, Indiana. Now we discover that he lives on Walnut Street, and we bet that his neighbors call him Colonel. And certainly we owe all apologies for suspecting that there wasn't any such person, for here he is again.

Among other words of wisdom he lets fall the following: "The conglomerate mind which is the Public's is swayed by impressions rather than by ideas. Whensoever an impression of sufficient intensity strides across the horizon of the Public, it rushes forth with open arms to seize upon it and press it to its stomach. These spasms of enthusiasm seem to be a necessary adjunct to anything new, which appeals to the romantic mind possessed in greater or less degree by us all. This denotes the open mind, and is a symptom of the progressive spirit of America—not counting the Navy."

Let us proceed to ratiocinate somewhat along the lines indicated by the Colonel.

'Tis a queer and entertaining world in which we live, and on the whole this is not a bad time to be born into it. There is a good deal going on. Nothing stands still, nothing stays put; nothing is settled or final, nothing is sure. Nobody knows where we are going, but everybody knows that we are on our way. Civilization is off on its biggest adventure, and the fact that there are all sorts of dangers waiting round the corner does not make the adventure any less exciting. And here we are, part and parcel of it all, with a small share and stake in the game and a part to play in it. Anybody who feels like kicking should be sent back to ancient Egypt to help build a pyramid, and see if he likes that any better.

I don't propose to get into any argument with Aristotle or St. Augustine or their modern philosophical equivalents as to whether this is the right sort of world. It was wished on me, as it was on you, and the only thing to do is to take it or leave it. And leaving it is one thing that most of us put off until the last minute. The only sensible thing to do is to try to understand it, and make the best of it. Moreover and furthermore, if enough of us should seriously undertake to make the best of it, the best might turn out to be not so bad after all.

To do so, we must get some glimmering as to what it is all about, and particularly as to what makes the wheels go round. It is rather interesting to sit around and speculate as to what started the world on its present roller-coaster trip through the trails of time. Some will vote for one thing and some for another, but I put most of the blame on the printing press. There's another question as to what brought on the printing press, which takes us out of our depth, but I think it can be shown that the modern world first began to move when ideas began to spread through paper and printers' ink.

Out of the printer's pie came all four and twenty blackbirds of the modern world. Travel and discovery, science and invention, education and industry, transportation and communication—all of them throve mightily on ink and type-metal. Increasing populations, nationalism, internationalism, war and peace, Babe Ruth, H. L. Mencken and the Anti-Saloon League, all flourish in the shadow of the printing press. For this, my beloved readers, is not the age of steel nor the age of science nor the age of pure reason—it is the age of Ballyhoo.

It started 'way back in 1477, if not earlier. William Caxton, first printer of the English tongue, had printed a book and could not wait for it to sell itself. So he printed a circular also and sent it out, announcing that if anyone wanted said books "let hym come to Westmonester into the almonestrye and he shall have them good chepe." And ever since that time if a man has anything to sell to the world he must first tell it to the world, and the greater his haste the more must he call on the magic of press and print.

Aviation, you will agree, is in a hurry. It came into the world as the favored god-child of a mechanical age, which presented it with the experience of a century to start off with. Overnight it grew up, found the strength of its wings and the might of its hands, and looked around for a world or so to conquer. And more than any other enterprise of history, it has depended on the gentle art of Ballyhoo to build itself a job that would match its powers.

It has been rather an amazing story, and it has been done quickly. Sometimes we grow impatient because the world at large still lags behind our own convictions and enthusiasms, but sober judgment tells us that no sweeping and fundamental change in human habits was ever brought about so quickly as the one which gave the world its wings. It is less than a generation since the first flight; it is less than a decade since the airplane was really ready and fit for its job; it is less than that since industrial organization caught up to technical development. In order to get where we are in this year of grace and prohibition, some notable giants of our times have given the young airplane a hand. The war, the transocean flights, the great governmental gesture of the air-mail, the contests for speed, distance and altitude records, the rivalry between cities and sections, the competition between great industrial and financial organizations, the love of sport, the passion for speed and the craze for novelty—all these have been on the side of the airplane in winning its place in the sun. And as a consequence of all this, nothing short of a world war can compete with aviation on the front pages of the daily press. As Mr. McNutt says, "the public has rushed forth with open arms to seize upon it and press it to its stomach."

All this is very nice and quite proper. Much of it has come about by accident, by which we mean that it has happened by the operation of natural law without benefit of press-agents. Lindbergh flew off alone to Europe because he is that sort of a bird, and no one was more surprised than he when the whole world fell on his neck. Others followed his trail or went elsewhere, because it was quite clear that the public liked it and would demonstrate their approval generously. The latest addition to transatlantic equipment for the airplane is a nice-looking girl in breeches, who is good for another ten thousand miles of column space in the newspapers.

But this can't go on for ever, and wouldn't do us much good if it did. It has aroused what we might call a "consumer curiosity" but what the business needs now is an increase in "consumer demand." And that, as every good business man will tell you, is something that rarely comes by accident. It is something that is artfully created, promoted and maintained, in order to offset the natural inertia, laziness and stupidity of the public. It comes under the name of Advertising, (*Continued on page 178*)

MANY DISTANCE FLIGHTS PLANNED

IN all parts of the world a number of plans are under way for transatlantic and other distance and duration flights in all types of airplanes. Some of these flights were scheduled for the early part of the year and additional plans appear at a rapid rate. Some of the pilots have already made attempts and were balked by the weather or the inability of their craft to take off with the required load. This has meant postponement of the date of departure and in some cases revision of the plans or abandonment of further attempts. It would be difficult to keep record of the many changes in plans announced for the various flights but in the following list a brief summary is given of the proposed flights as they are reported at the time AERO DIGEST goes to press.

Flights from France in order to have the approval of the government must be made with seaplanes which have demonstrated their ability to alight safely and remain afloat on the ocean. The government looks with disfavor upon flights proposed with land planes and private flights with such planes are being discouraged as not being in the best interest of aeronautics.

New York to Rome

Capt. Cesare Sabelli, Roger Q. Williams, pilot, and Peter Bonnelli, navigator. Plane, the *Roma*, a Bellanca Model K monoplane, equipped with a Pratt and Whitney Hornet engine of 500 h.p. at 1900 r.p.m. Speed 140 m.p.h. (Plane described in June issue of AERO DIGEST.)



Roger Williams (left) and Cesare Sabelli in the Roma *Acme photo.*



The Roma in a recent test flight with wheels folded *P. & A. photo.*



The tri-motored Couzinet monoplane to be flown by M. Drouhin

New York to Berlin

Thea Rasche and Ulrich Koenemann, co-pilot. Plane, a Bellanca monoplane.

United States to Denmark

Bert Hassell and Parker Cramer, co-pilot. Plane, *the Greater Rockford* is a Stinson-Detroiter. They plan to fly from Rockford, Ill., to Copenhagen, Denmark.

Philadelphia to Paris

Louis V. Emberger and Lieut. Arthur Gain. Plane, a twin-motored Sikorsky.

New York to China

Tien Lai Huang accompanied by Jack Lynch, Jimmie Angel and a navigator. Plane, Prudden all-metal monoplane equipped with a Wright Whirlwind engine. Cruising speed 110 m.p.h.

Round the World Race from New York

Personnel, John Henry Mears and Charles B. D. Collyer, pilot. Plane, the *City of New York*, a Fairchild folding wing cabin monoplane powered with a Pratt and Whitney Wasp. They will attempt to set a new globe-circling record in 23 days through the combined use of airplane and steamship.

France to United States

Lieut. Paris accompanied by chief petty officer Marrott and petty officer Cadou. Plane *La Frégate*, C.A.M.S. flying boat powered with two Hispano-Suiza engines of 500 h.p. each. Speed 130 m.p.h.

Maurice Drouhin and M. Couzinet. Plane, the *Rainbow*, designed by Couzinet, powered with three Hispano-Suiza engines of 180 h.p. each. Carries 9000 kilos of fuel and equipment.

Major Louis Idzikowski and Major Casimir Kubala, the Polish fliers. Plane, *Marshall Pilsudski*, a biplane of the A.E.C.M.-Amiot type with a Lorraine-Dietrich engine, which has a radius of 9000 kilometers.

Captain Dieudonne Costes and Lieut. Comdr. Joseph Lebrix. Plane, Breguet biplane with a 600 h.p. water-cooled Hispano-Suiza engine. Flying radius of 8,500 kilometers.

Lucien Boussoutrot and Louis Bleriot, 2nd. Plane, Bleriot hydro-airplane with four Hispano-Suiza engines. Route, via Azores.

M. Challes. Plane, Breguet biplane equipped with a Lorraine-Dietrich engine.

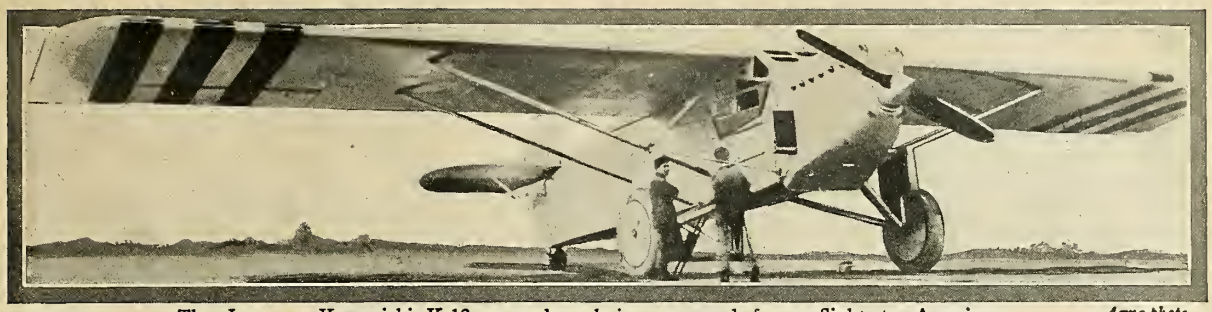
M. Tarascon. Plane, the *Tangobird*, a Bernard monoplane with 420 h.p. Gnome-Rhone-Jupiter engine.

M. Draikin. Plane, Potez-Farman monoplane.

Michael de Troyat. Plane, the Farman biplane *Bluebird*, with two Farman 12-cylinder engines of 500 h.p. each, mounted on upper wing en tandem.

Capt. Conduret and Count Louis de Mailly-Nesle. Plane, Bernard-Hubert.

Lieut. Sala to be backed by the French Ministry of Marine.



The Japanese Kawanishi K-12 monoplane being prepared for a flight to America *Acme photo.*

Italy to United States

Captain Ferrarin and Major del Prete, Italian airmen who recently broke the world's duration record. Plane, Savoia-Marciette with S-64 Fiat A-22 550 h.p. engine. The plane, a thick winged monoplane, can fly 70 hours at a speed of 90 to 115 m.p.h. and has a cruising radius of 6,500 miles. The engine, which is water-cooled and installed above the wing, is fed from 27 tanks fitted in the wing. The cockpit is just beneath the engine in the center of the wing. There is a bunk in one section of the wing, where the pilot off duty can sleep. The plane carries a radio with a sending radius of 300 miles and a powerful searchlight on top of the center of the wing.

Germany to United States

Personnel, Ernest Udet in a twin-motored Rohrback flying boat with a capacity for 16 passengers, backed by the Rohrbach Works.

Johann Risticz and Von Bentheims. Plane, Junkers monoplane, the *Europa*, a sister ship of the *Bremen*, powered with a Junkers L-5 engine of 230-310 h.p.

The German Zeppelin LZ-127, known as *Count Zeppelin*. It will be able to carry 20 passengers, 15 tons of luggage, mail and freight and crew of 26. Five Maybach type VL2 engines of 532 h.p. each will supply a total engine power of 2650 h.p., giving the ship a speed of 80 m.p.h.

The general disposition of the LZ-127 is very similar to that found in former Zeppelin ships: the front car containing navigating rooms and passenger accommodations is arranged rather near to the bow; in the middle of the hull there are two pairs of side nacelles and further back, a single nacelle, each of which will be provided with an engine. Each of the five engines will directly drive a propeller.

England to the United States

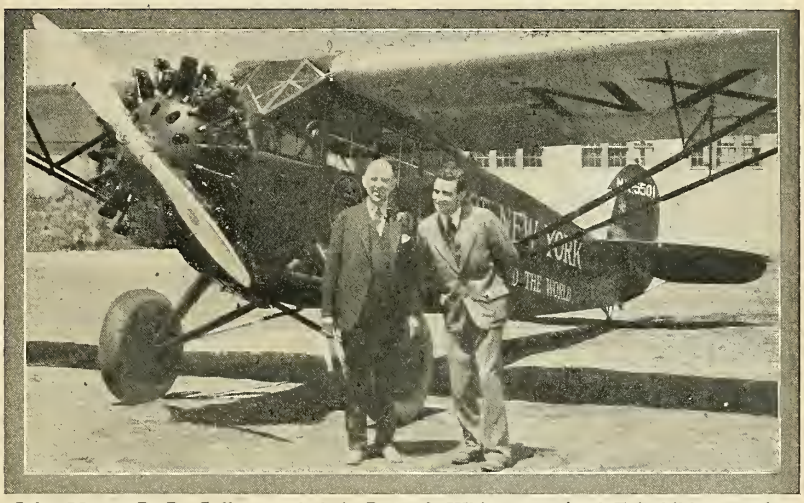
Capt. Frank T. Courtney. Plane, Dornier-Napier Whale flying boat equipped with two 450 h.p. Napier Lion engines. Their route will be via the Azores.

The English dirigible, R-100, which will carry 100 passengers, a crew of 40, and 10 tons of mail and freight. With full load the ship will have a radius of action of 4,000 miles at a speed of 75 m.p.h.

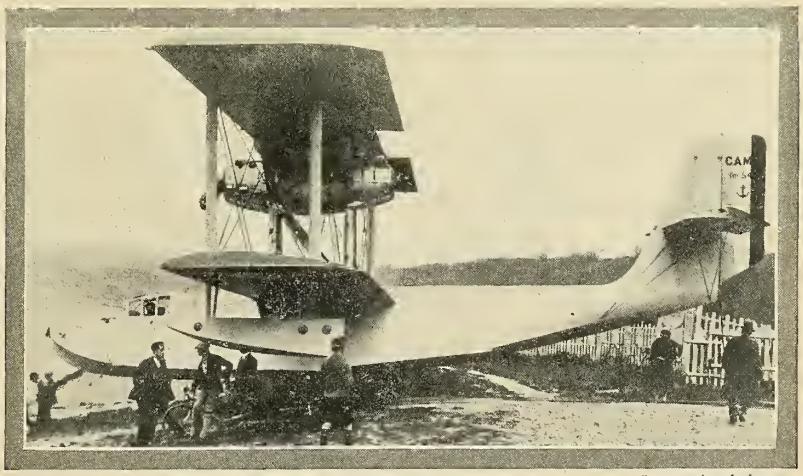
English dirigible, R-101, also plans to make the trip.

Spain to New York

Ramon Franco accompanied by Major Eduardo G. Gallanza, Pablo Rada and Capt. Julio Ruiz de Alda. Plane built by C. A. S.A. of Spain. Has four engines which develop 2000 h.p.

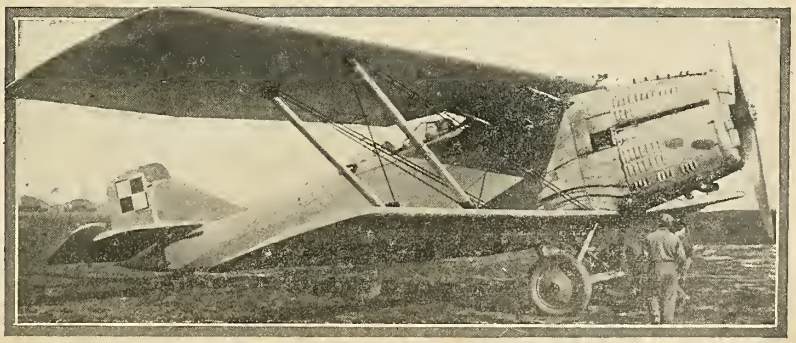


John Mears, B. D. Collyer and their Pratt & Whitney engined Fairchild monoplane



International photo.

French twin-engined CAMS flying boat of Lt. Paris



The Polish Amiot biplane, at Le Bourget field *Acme photo.*

THE PN-12 NAVY PATROL PLANE

By Henry S. Cocklin

Aeronautical Engineer

The author has been connected with the Engineering Department of the Naval Aircraft Factory for ten years, the last five of which he has been in personal supervision as project engineer of all Navy Patrol flying boat construction.

THE PN-12 seaplane, A-7384, built by the Naval Aircraft Factory, broke and extended the endurance record (Class C2) on May 3, 4 and 5, at Philadelphia, by staying in the air over the Delaware River and Bay for 36 hours, 1 minute and 13.8 seconds. The plane took off on a southwesterly course from the Naval Aircraft Factory, in the afternoon at 2:50:16-1/5 o'clock, eastern standard time, with Lieutenants Arthur Gavin and Zeus Soucek at the controls. The plane was fitted out with the regular service equipment except that no ordnance or radio was carried. The plane weighed about 19,000 pounds, with an overload of 375 gallons of gasoline, which brought the gas capacity up to 1,520 gallons. The surplus gasoline has to be put into the main reservoir system manually by the mechanics, Mr. G. C. Proley and Mr. W. F. Dayton. The course during the few daylight hours of the first day was from the east end of the Yard to Reedy's Island. At nightfall, this was shortened so that the river lights could be used as a guide. The following day the plane extended the course again and during the afternoon used the Bay exclusively. The following night the schedule returned to the cycle of the previous night, until about midnight when the plane circled the Navy Yard for approximately 3 hours until the landing was made in the early morning at 2:51:30 o'clock, eastern standard time. Mr. C. F. Schory was the official timer and represented the National Aeronautic Association as directing official.



The PN-12 on its record flight over Delaware Bay

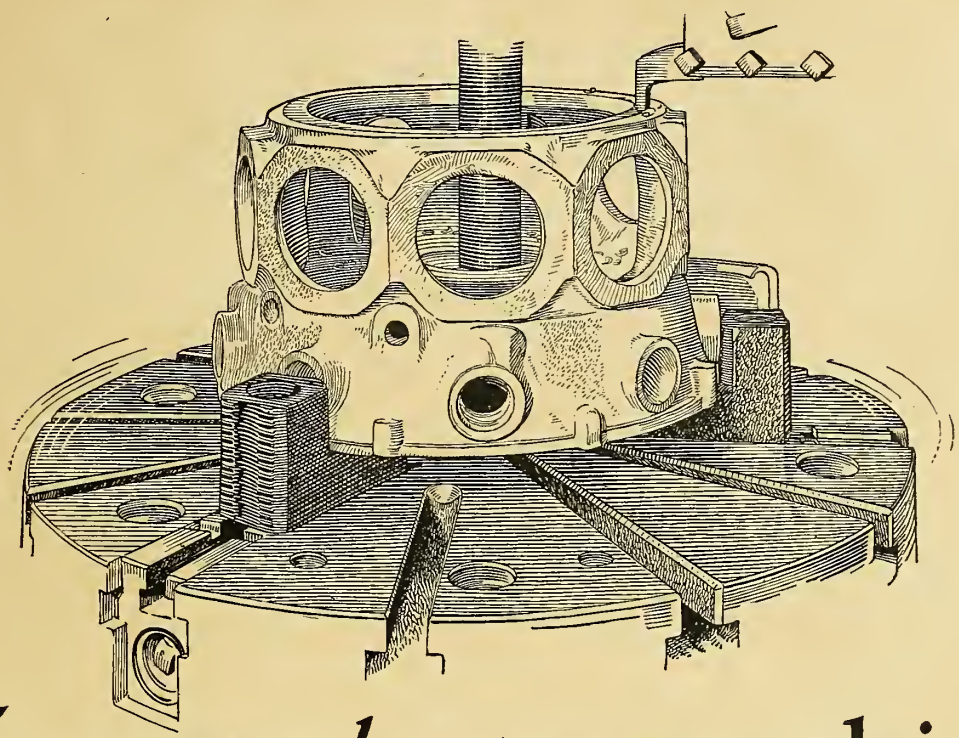
The time of take-off was forced by tide conditions. Heavily loaded seaplanes are aided in the take-off by shoal water. A get away had been executed at 9:30 a. m., which indicated a satisfactory operating condition, with a few minor adjustments. The weather was so ideal that it was decided to start the flight even though a night landing finish would be made. This excellent weather continued during the entire time. The late start, of course, added to the hours which the personnel had to remain on watch. However, snatches of sleep could be gotten in the plane as the hull interior will permit of full length reclining. This is a considerable advantage over the older planes, where bulkheads and frames prevented even this rugged comfort. In the early afternoon a fresh breeze picked up and with the tide running out a quick get away was made. This was practically the only strong wind experienced during the flight. The nights were lighted by the full of the moon. It had been just three years before on the 1st and 2nd of May that the PN-9 had established the 28½ hour record.

On May 25 and 26, the same PN-12 plane broke and extended the range and endurance marks for seaplanes (Class C2) carrying 1000 kilograms of weight by remaining in the air 17 hours, 55 minutes, 13.6 seconds, and covering a distance of 2000 kilometers over a measured course. The flight had to be discontinued because of a severe rain storm. The gas supply on board was sufficient to have kept the plane in the air 8 hours longer and 300 miles farther.

The purpose of the flight was to get a line on the general performance and staying qualities of the operating or functional parts of the plane. As the industry well



The record-breaking PN-12 Navy Patrol Plane equipped with twin Wright R-1750 engines



Two weeks to machine a crankcase section—

ALUMINUM, known for the tricks it plays in process, is most sensitive to the treatment of cutting tools; yet most essential to the lightness of a fine aircraft engine. It strains against its moulded shapes; it swells from heat generated in machining. One section will warp in protest at the treatment given another.

Two weeks go by before a crankcase casting is fully machined ready to be assembled in an engine. Two weeks—time not necessary for machining alone but time which Wright machinists know should be allowed for readjustment of the metal between successive operations. These men know their metal—know its peculiarities of stress and strain—its tendency to warp and run out of shape under the heat generated by cutting tools. Each man knows how much heat the part he makes will stand before expanding—knows how much heat each cut involves—knows when to stop before warping begins. He will machine one part; then jump to another. He knows when a casting needs a "rest", and sets it aside for two days, or even three, before machining again.

By such careful procedure, Wright Crankcases are brought into shape without strain; machined thinner and lighter with no sacrifice of strength; worked slowly to the point where the finished piece is worthy of being called the "finest aluminum casting made."

Another reason "Why More Pilots Fly Them."



Wright "Cyclone" Aeronautical Engine

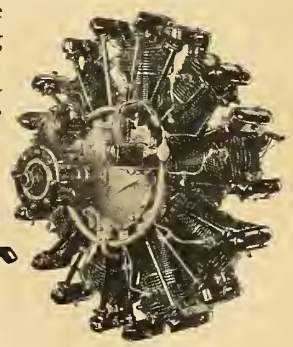
That's why More Pilots fly them!

WRIGHT

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Wright "Whirlwind" Aeronautical Engine

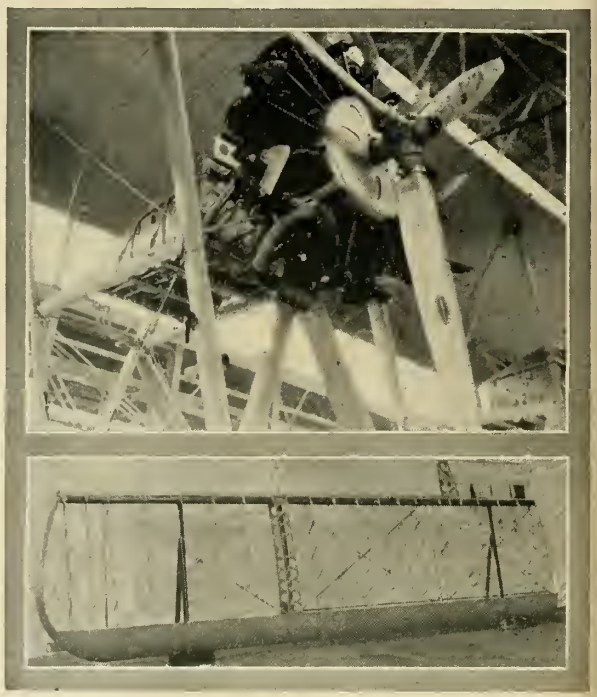
knows, planes require a good shake-down flight upon being put into service before it may be said they are air worthy. The PN-12, in general, is very little different from the PN-7, PN-8, PN-9 and PN-10. The shape of the hull, wing area and tail characteristics have been changed very little in any of them. The increased performance has come largely through power plant and structural lightening. The engine installation is the principal change from the immediate predecessor. The PN planes have always utilized water-cooled engines. The PN-12 uses the Wright R-1750 radial air-cooled engine of 525 horse power at 1800 r. p. m. To date this engine has had very little service testing. One engine had been installed in the engine manufacturer's test plane and another was for a short time in a Navy torpedo plane, but it has been left to the patrol plane to furnish the intensive flying test which is gotten by endurance flights. Twin tractor installations with direct drive propellers are used. The direct drive propellers do not give the advantage in the thrust for take-off which is required. Thanks to a big saving in power plant weight by the elimination of a water-cooling system and by structural lightening, the lack of reduction gear drive was not felt so greatly. The engines were operated at speeds of from 1700 to 1250 r. p. m. The take-off revolutions were about 1550. This picked up as the plane reached its altitude and leveled off; but this lasted for but a few minutes, when the engines were throttled down and the mixture leaned out. The grind



Hull and cockpit details of the Navy PN-12

then was on—with revolutions from 1600 down to 1250 at the finish. The installation was standard except for a special scheme of rocker arm lubrication. The operation was very smooth and free from incident. An auxiliary deserves some mention. It has always been very difficult to get a fuel pump, which would give satisfactory service. Wind driven pumps were practically always used. For this plane there was adopted, after considerable test, the engine driven "Adco" pump. The suction head is very great. While this remained unbroken no trouble was experienced and more than sufficient fuel was forced through the gravity tanks.

Five years ago, in the PN-7, the first serious attempt was made to improve the patrol plane through the adoption of the USA-27 wing contour and the reduction of the truss structure. This has been retained in the PN-12. The loggy hulls of wooden construction were discarded for the aluminum alloy ones in the PN-8. Except for minor changes on framing and a reduction in bottom thickness, the hull is the same in the present plane. Both of those planes had improved power plants over the F-5-L, but it



Engine installation and wing skeleton, PN-12

was not until the adoption of the gear reduction drive of the Packard 1A-1500 that a real advantage in power plant was effected. With this reduction gear, loads of nearly 10 tons were raised from the water and the plane was fitted for long distant patrol work through the greatly increased gas reservoirs. Up to this time, the wings were designed for 14,000 pounds service loads, but with the PN-10s it was decided a more rugged ship was desired and the wings were designed to service loads of 18,000 pounds. By adopting metal construction, the PN-12 has been given lighter wings, which carry with larger factors of safety 30 per cent more load than the PN-7. The tail surfaces have been metal framing with fabric covering since the PN-8 model, but due to a desire to have adjustable stabilizers, a new and much sturdier and lighter set of surfaces was developed for the PN-12. In addition to the power plant, then, considerable reductions in weight have been made by metal constructions of a highly efficient type. These reductions in weight made it possible to take off more gas with A-7384 than with either the PN-9 or PN-10. The wing beam construction is very sturdy and well adopted to production methods through power presses and automatic riveters. The beam development is largely the work of Mr. F. E. Seiler, a former colleague of the author. All surfaces are fabric covered to give the necessary opportunities for inspection and maintenance at times of overhaul. The (*Continued on page 174*)

ANOTHER TRIUMPH FOR B. G. SPARK PLUGS



On the Kingsford-Smith Flight

CAPT. KINGSFORD-SMITH attributed the success of his trans-Pacific flight in a large measure to "100% preparation." Only equipment of first quality and known reputation was used. Naturally, Kingsford-Smith selected B.G. Mica Hornet Spark Plugs.

Other recent flights on which B.G. plugs have proven their reliability are the Curtiss Marine Trophy Race in which first, second and third planes in all classes were equipped with B.G. Plugs, won by Major C. A. Lutz of the U. S. Marine Corps, and the endurance and altitude records set by the PN-12 Navy plane, flown by Lieutenants Zeus Soucek and Arthur Gavin.

From the polar regions to the equator, B.G. Mica Spark Plugs are relied upon by the pioneers of the air.

Capt. George H. Wilkins used B.G. Hornets on his flight from Pt. Barrow to Spitzbergen, and the Southern Cross flew thousands of miles in the vicinity of and over the equator.



ACTUAL SIZE

B. G. plugs are made in several different styles and types. Each one is a finely made plug built to do its job perfectly.

B. G. Mica Hornet Spark Plugs are not cracked or broken by mechanical shocks or severe detonation. They stand up sturdily in severe and crucial emergencies. They are dependable and can be relied on to "pull planes through".

B. G. Mica Hornet Spark Plugs have proven themselves in both High and Low Compression engines. A set of 18 of these plugs weighs less than 33 ounces.

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The B.G. Corp. 136 W. 52nd St., New York

B.G. "HORNET" MICA SPARK PLUG

THE OCKER-MYERS METHOD of BLIND FLYING

By Ray H. Boudreaux

SEVERAL writers have, within the last few months, attempted to write an explanation of the Ocker-Myers method of flying blind. Up to the present no writer has presented a clear understanding to the air-minded public of exactly what the method purports to do. Many fanciful and absurd stories have been cited about blind flying conditions met with by pilots who were not familiar with the "artificial horizon" and these stories, rather than aiding in the instruction of the Ocker-Myers method, have created an attitude of doubt on the part of the experienced and thinking pilot.

This article is written to correct the false impressions that have been created by such imaginative writings and the writer hopes in these lines to give to the reader a sound and instructive description of what the Ocker-Myers method actually attempts to establish.

The writer has been closely associated with Captain William C. Ocker and Flight Surgeon David A. Myers during the final stage of development of the method and also having been present during many of the tests, he is sufficiently acquainted with the "artificial horizon" to give a proper interpretation of it to the pilot and those interested in flying.

To properly grasp the meaning of the "artificial horizon" and to appreciate its full significance the individual must possess a clear understanding of the fundamentals of equilibrium, or, "balance sense." From the time of the late World War down to the present thousands of pilots and air men have been carrying on flying operations in complete ignorance of the main facts which govern their equilibrium or, to be explicit, their ability to place themselves in any position which it is desirable or possible to take.

The old time classification of pilots placed them in two categories: the natural or the mechanical pilot. It is not necessary here to discuss the merits of the mechanical pilot but for the sake of later comparisons in this article the natural pilot must be defined.

A natural pilot was and is one who, by the acuteness of his natural senses, can, under ordinary flying conditions, maintain his plane on an even keel or place it in any position that it is desirable to put it. He seems to possess a natural aptitude in correcting for skids, slips, stalls, etc. In other words he adjusts himself to the environment of flying in a natural manner. This flying ability increases with experience. The natural pilot states that he possesses a "feel of the ship," which is most certainly true with one exception—and that exception is found under "blind flying" conditions. The exception is: no pilot can, under "blind flying" conditions, operate an airplane on an even keel for a sustained period of time when relying on his natural flying ability or, "the feel of the ship."

The term "blind flying" describes those conditions met with when the pilot no longer can see the earth beneath him, the sky above him, or some object that will give him the position of his plane with respect to the perpendicular and the horizontal.

To those pilots who scoff at the exception laid down above the writer wishes, out of fairness, to state that he well realizes that many of you have flown under "blind" conditions for short periods of time and gotten away with it. The writer has done so many times himself, but, after being educated in the Ocker-Myers method, the positive knowledge that he now possesses is that all former attempts at "flying blind" (relying on natural flying ability) were simply hazardous coasting flights combined with plenty of the old rabbit foot.

It is true that within the last two years many pilots have flown "blind" for several hours at a time but the writer, after careful checking of facts, has found that these men either made use of the Ocker-Myers method or created for themselves a system of "blind flying" comparable to it.

Before describing the method let us review some of the facts responsible for the establishment of man's equilibrium.

How We Maintain Equilibrium

Man's ability to maintain his equilibrium, or to be more explicit, his capability of keeping his poise or balance with respect to his varied surroundings, depends upon the proper and unrestrained functioning in a coöperative and coordinative way of his five "special senses," namely: sight, smell, hearing, taste and touch, as well as the stimulus given to his brain by two other things—the "muscle sense" and the action of the "vestibular or inner ear."

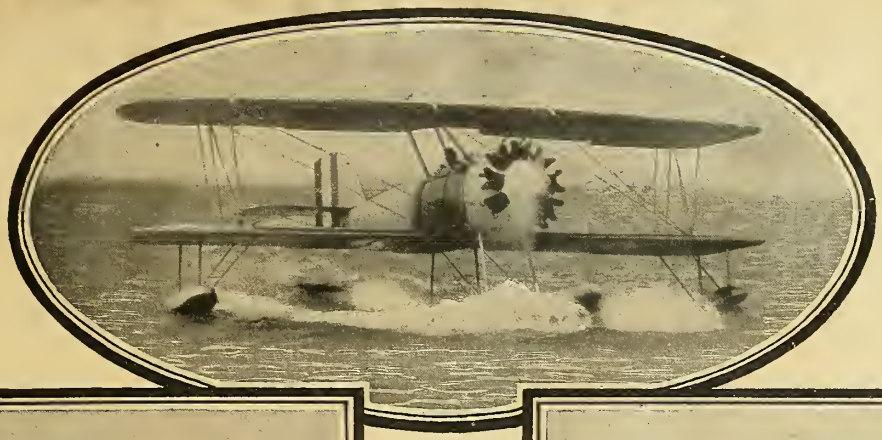
Four of the seven factors have but slight bearing upon equilibrium and will not be considered in this article. They are the senses of taste, smell, touch and hearing. The remaining three—sense of sight, muscle sense, and the functions of the inner ear seem to be the chief means by which we obtain our "equilibrium sense." What the mechanics of the inner ear are will not be discussed in this article. Neither will the phenomena behind the "muscle sense" or the "sense of sight" be treated.

We are concerned with the fact that stimulation arouses action and action eventually results in consciousness, a knowledge of our environment, and a perception of the physical facts constituting that environment. In plain words, the effect and not the cause interests us.

The consciousness resulting from stimulus of the sight sense is clear to all of us. We know that our "muscle sense" is dependent upon experience for its perfection. It is the sense by which we perform common daily acts unconsciously and automatically. It is the sense that tells us how hard to press on the screw-driver to force the screw into the wood; how hard to lean against the wall and not fall over. We do not possess this sense in infancy but acquire it through years of experience. The degree of perfection which it attains is dependent upon the individual. The degree of development of the "muscle sense" is also dependent upon what vocation in life each of us follows:

The vestibular or inner ear, under stimulus, causes certain actions in our anatomy that aid largely in determining our equilibrium or "balance sense." Recently many eminent men connected with the medical world have devoted much time, thought and study to the inner ear. At the present writing, opinion is, as yet, divided as to exactly what is the physiological status of the inner ear. We do know at this time, however, that we can expect certain definite reactions on the part of the physical being as a result of stim-

(*Continued on page 183*)



Vought "Corsair"



Fokker F-10 Tri-motor Transport



Lockheed Mail and Express Plane

High Speed and the Single Row Air Cooled Radial

The Vought "Corsair", a standard two-place Naval observation type, carrying an observer and its Naval load, and equipped as a sea plane, was recently flown by Lieutenant S. W. Callaway, U. S. N., over a measured course, and officially timed at 159.1 miles per hour.

The Lockheed mail and express ship equipped with a commercial "Wasp" and carrying a pay load of 1,000 pounds, has been officially timed over a measured course at 167 miles per hour.

The tri-motor Fokker F-10 recently delivered to Western Air Express for regular passenger service between San Francisco and Los Angeles, has demonstrated a high speed of a little less than 150 miles an hour when flying with its full pay load. The F-10 is equipped with three commercial "Wasp" engines.

The three widely differing types indicated above prove beyond question the high speed of service as well as commercial ships when fitted with the 400 H. P. air cooled single row radial "Wasp". This performance is possible because of minimum head resistance due to uninterrupted air flow around the exposed parts.

THE
PRATT & WHITNEY AIRCRAFT CO.
HARTFORD CONNECTICUT

PERSONAIRLITIES



by Caldwell

DID you have any trouble with your furs last winter? I mean, when you took out your fur neck-piece, or earmuffs, or whatnot out of storage last fall, did you find that moths had been at it? Did you discover, to your horror and chagrin, that you had been rooming and boarding a flock of moths during the summer? If so, the picture on this page will suggest a means of combating the evil.

Simply hang your furs—your neck-piece or muff, or whatever it is you wear—on the wings of an Alexander Eaglerock, and go for a flight. If you haven't an Eaglerock, use any other good plane—you will find several advertised in this issue. Almost any type of plane will serve, except a metal one. Don't attempt to use a metal plane for this purpose, for you will find it almost impossible to tack your furs along the leading edge of a metal wing. You might rivet them on, of course; but remember—rivets are expensive. Far better to stick to the wooden wing, because carpet tacks are cheaper than rivets and much handier to use. Besides, you can pull them out easier than you can rivets. However, if you own a metal plane, don't throw it away simply because you can't tack your furs to it. Get a pot of strong glue, and glue your furs to the leading edge. If you have an edge on, yourself, all the better.

Now then, having secured the furs to the wings—by tacks, rivets, or glue, as fancy dictates—take off and go for a good long flight. The moths, surprised and disgusted at this drastic move of yours, will register annoyance. Pay no attention to them. Ignore them. Go right on up to a thousand feet and do a loop. This will infuriate them and cause them to gnash their teeth in rage and despair. You, however, will merely laugh sardonically—or carbonically, as you prefer—and do two more loops and a roll.

Now, just glance along the wings. Do you see the moths leaving your furs? Do you see them leaping off into space—at regular space rates? Do you hear their low, snarling cries of rage as they disentangle their feet from your furs and go winging off under their own power, not even pausing for a final bite of fur before they go?

If you see and hear all this, you will know that your tactics have been successful, that you have made every moth air-sick. Every moth, that is to say, except the aged and infirm. Those—too weak to get off by their own efforts—you may knock off with a mallet. They will offer no resistance to your determined attack.

I AM indebted to Walter F. Halley, President of the Rapid Air Lines, Inc., Rapid City, South Dakota, for this moth-removal and discouragement idea, which is fully protected by copyright—an idea like that needs quite a lot of protection. However, the idea is mine, not Walter's. (I doubt if he ever had an idea that good.) Still, he had a pretty good one, at that. He writes:

"This picture shows the results of a few scattered hours of coyote hunting from an airplane, during a period of five weeks. The total bag was seventy-seven coyotes. And here's how it's done: The pilot flies over the prairie at an altitude of about 150 feet. When a coyote is spotted he dives to allow his hunter an opportunity to shoot. Clyde Ice has been the pilot during all of our hunting; and Charles Orlup of Rapid City, and Earl Wilson of Bellefourche have alternately acted as gunners. Both are crack shots: it is unusual for them to use more than one shot for a coyote. On one occasion Orlup got three coyotes with three shots *in one dive*. The Wool Growers' Association and the Stockmen's Association in various Western South Dakota counties have requested that this coyote combat team be put on full-time duty, until these pests are eliminated from South Dakota."

And when these air hunters finish off the coyotes, they might fly down to Washington and do a few useful dives above the Navy Building.

THE Professional Pilots Association advise me that a meeting of the Association was held in Los Angeles at the *Pollyanna Tea Shop*. Who is president of our Association now, boys—? Is it Sophie Irene Loeb? Or Ella Wheeler Wilcox? "Oh Caesar, thus is thy greatness fallen!"

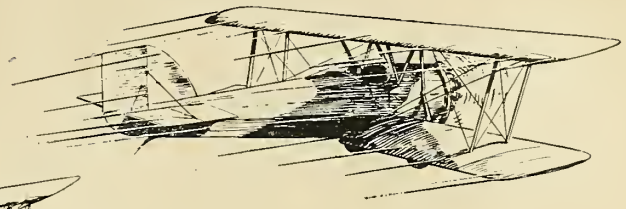
NOW here's Lieut. Norman A. Goddard, one of the old timers who should have been filled up with concrete and sunk some place, years ago. Its amazing how some of these old birds hang on—every now and then I get letters from men who started in aviation shortly after the burial of King Tut, and are still at it, long after old Tut has been dug up again. Goddard received his training in the old Royal Naval Air Service in 1914, and did patrol duty over the North Sea, which gave him such a love for the water that after the war he put in three years barnstorming—or perhaps beachcombing would be a more descriptive word—on the Northwest Coast of British Columbia with a Jenny on floats. And what a bright and snappy seaplane that must have been! I infer that he merely taxied up and down said coast. But I suppose he put a Hisso in it, for he says that he migrated to California in 1921—and how could anyone get to California with an OX5 Jenny on floats? His harrowing experiences with this crate so unsettled him that he started an aircraft factory and went broke, operated a flying school, joined the U. S. N. R., and finally got tangled up in the Dole race. Here luck rode on his tail, for his plane, "El Encanto," got cracked up at the start, thus saving him a long and possibly wet trip. From the remains of that plane, God-

(*Continued on next page*)



"Thar's ky-yotes in them hills"—and some on the planes.

At last!









An Aircraft Lacquer that definitely resists the sun's ultra-violet rays —

HERE'S good news for all concerned with the finishing of aircraft—Murphy Aircraft Clear Flexible Finishing Lacquer.

Here is a *clear* lacquer of revolutionary properties. It is flexible—resisting the treacherous workings of aircraft surfaces. It is absolutely impervious to the ultra-violet rays of the sun (the only lacquer we know of that is). Sunlight destroys most finishes, but it *strengthens* this one. It actually improves with age—a most unusual feature.

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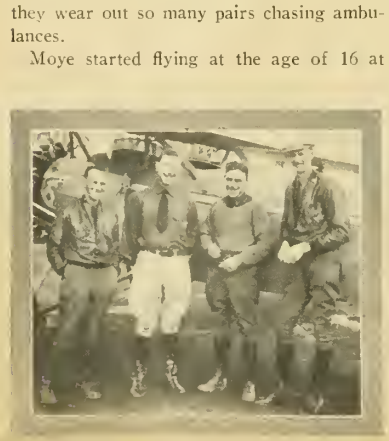
(Person.AIRlities continued)

dard constructed the Wright Whirlwind monoplane, "Gypsy," now Federally licensed for commercial use. "Aviation has knocked me down and out a number of times," says he, "but somehow I have always managed to eat and have a ship to fly." In fact, now he has a first class field and school of aviation on Stanford University Campus, Palo Alto, California, with two Waco training ships and the Gypsy.

Associated with him are W. H. Brown and Moye Stephens. Brown started the war in the Canadian Infantry, got tired of walking, and joined the R. F. C., putting in 700 hours over the lines, bringing down eight Huns (pardon me, they're "the late lamented enemy" now), and winning the Military Cross. So you see he's quite a stout lad. After the war he flew with Goddard in British Columbia, lost his ship in a storm when it cracked up on the rocks of B. C., and then flew for the Dominion Government on forest fire patrols, fishery protection, and aerial photography. Then he started a flying school in Victoria, where most of his pupils were Chinese. One of them should have stuck to the laundry business, apparently, for he cracked up Brown's one plane, driving that hard-working hero on the rocks again. Now he's instructing at the Palo Alto School, and eating regularly, though he doesn't favor Chinese cooking. Whenever he sees a plate of chop suey he thinks of that Chink pupil and his wrecked training plane. He says the way to settle that war over in China is to put all the Chinese into airplanes, and they'll make a smashing success of it.

Moye Stephens is a law student at Stanford University, but also holds a Transport Pilot's License. I congratulate him on the latter accomplishment only, as we have too many lawyers now. He plays the air game both ways—in a court-room and in a plane. Still, there are points of resemblance in the two businesses—the pilot takes his passenger for a flight, and the lawyer often takes his client for a ride. But you can sometimes walk back from a flight, though it's another matter walking back after a lawyer has taken you for a ride. Frequently he has your boots, pants, and shirt. Lawyers are especially eager to collect your boots—they wear out so many pairs chasing ambulances.

Moye started flying at the age of 16 at Rogers Airport, with Eddie Bellande, who is now on the Maddux Air Line. In those days, he confesses, "I used to hang around the field, content just to gaze at the aviators." Fancy that now! "They seemed like gods to me, and I thought it was wonderful if any of them noticed or spoke to me." Well, he soon got over that. They gave him twelve minutes in the air in return for a day's work around the field, and finally soloed him. Now he has had over 1,000 hours, has flown for the movies, instructed movie stars, worked for the American Aircraft Corporation in Los Angeles, the Palo Alto School, and "am trying to figure out combining aviation and law, and I believe it can be done." Why not? The law and the ambulance business have been combined for years—why not the law and airplanes?



Brown, Stephens, Wheat and Goddard.



What goes down must hang up; sometimes on a high tension line.

OOOOH! Look at the brave parashooter. These pictures are full of suspense, for the hero is suspended on a 15,000 volt high tension line near Ventura, California. "The enclosed snap-shots represent my one venture from my present stamping-ground among the mules," writes F. M. Coray, who describes himself as a tiller of the soil, or Ranch Superintendent. "Just a charitable gesture to promote air-mindedness among the local inhabitants." He doesn't say how many local yokels leaped into the air in a frantic endeavor to emulate his parachutical activities, but I suppose there were vast numbers. Who can watch Coray dangling from that 15,000 volt conveyer and not yearn to be hanging beside him?

Coray belongs to the 476 Aero Squadron, 322 Pursuit Group of Clover Field, he tells me, which rates him in Earle Ovington's opinion as something smaller than an electron, a molecule, or subdivision of same, Coray believes. "My Pursuit Group has but one ship," he concludes. "Were I fortunate enough to get a chance to crash it, how could my squadron make good a promise to my wife to drop flowers on my cortege?" Coray says that such authorities as Hard-boiled Biffel, Blakely, and Pop Croft sold him the idea that his agricultural training should have precedence over air training, were longevity to be considered in choosing an occupation. After a glance at the pictures, the opinions of Messrs. Hard-boiled Biffel *et al* are hereby confirmed.

AL GRAHAM, Chief Pilot, Crescent Air Service, Inc., Camden, N. J., started flying in 1920, barnstormed for four years, helped Capt. M. K. Riddick to start the Pilottown Air Mail Route in 1923, and last summer ferried part of the World's First—and, I hope, last — Flying Orchestra over 2,200 miles of country. If this hasn't unsettled him for listening to any more music, then nothing will. It's bad enough listening to the neighbor's radio, but imagine having to fly around with the thing. You can see this chap Graham has a vast capacity for quiet suffering.



"Al" Graham

Al used to be with York Airways, offspring of the Manchester Cigar Co., for whom poor old Redfern used to fly. Al is sorry to part from the home brew of York. "Boy, those people sure know their hops and malt," he says. But they are not entirely ignorant of it, even in Camden. I regret to report that Al becomes actually insulting in his letter. "A year or so ago my cousin drove you from Pine Valley to the Walt Whitman Hotel. He said he didn't mind driving you except that he was worried for fear the police would arrest him for transporting liquor."

PILOT Fred Schwaemmle says he would like to hear from his former Buddies who graduated with him at Kelly Field on Feb. 1, 1924. Apparently he has mislaid the whole lot of them. Write him at Pitcairn Aviation, Greensboro, N. C., operators of the Greensboro Municipal Airport. Pilot Sidney Molloy, of Columbia, Miss., is manager for Pitcairn there.

WHAT do you think of W. B. Garrett of Thermopolis, Wyoming? "I have had ten hours' instruction from Major R. L. Copsey, ex-Kelly Field instructor and Commander, Wyoming Legion. I am now making passable landings, and it is over two hours since he jerked the controls away from me. Am now looking forward in hope and

(Continued on next page)



WHEN THE THERMOMETER SAYS 85°

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CREATED BY LAMOGLAS — Eyes for the Skies

HERE is the perfect summer goggle—Seesall—the goggle that is worn "loose." The pressure of the wind closes all air gaps. There is a cool air space between the light rubber and your face. No friction—no headaches—no eyestrain—even when worn for hours. The widest vision goggle. You'll forget to take it off.

SOLD by dealers everywhere for fifteen dollars. But if more convenient, send us your check for this amount and we'll send you by return mail, prepaid, a Seesall handsomely packed in a metal container. Tinted lenses at no extra charge.

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AIR ASSOCIATES, Inc., carries a complete stock of Lamoglas Goggles and Northeaster Flying Togs at their Curtiss Field store, Garden City, L. I. and at their Fifth Avenue salesroom, N. Y. C.

(PersonAlRlities continued)

fear of the solo. Am a farmer, and 57 years old this month."

You're as good a sport as General Patrick—and he's one of the world's best. It wouldn't surprise me a mite if you took off on a solo flight to Australia before some of the younger pilots got started. Why don't you try to get in the Navy? You might encourage some of those old admirals to take lessons from you.

THE dressy lad in the ice-cream breeches, snappy field-boots, form-fitting sweater, helmet, and Meyrowitz goggles is none other than Pilot Jack Frye, president of the Aero Corporation of California, distributors of Fokkers and Eaglerocks in California and Arizona, where men are men—or movie actors. He writes: "We've been out here in this land of sunshine and flowers until we've gotten that way too—whatever it is." I suppose he means that living in Calimoronia gives one a sunny and flower-like disposition. I'll have to take his word for it. He continues, "The Aero Corporation is keeping from six to eight Eaglerocks and a couple of Fokker Universals busy. We expect to run an airline to Dallas, Texas, and within five years to be giving an hourly service each way, twenty-four hours a day. Also to operate down the West Coast of Mexico into South America. Eaglerock sales have amounted to forty so far this year (May 17). We expect to sell 150 this year; and next year that should be boosted to about 500. Our complete permanent organization is now composed of over thirty people." And all that from a start six years ago, flying Jennies and Standards. Jack has put in over 2,000 hours in the air.



Jack Frye

THE determined looking individual on our left, wearing one of those jackets you could play games on, is Pilot Paul L. Carpenter, now training for sales promotion work with the Alexander Aircraft Co. When he gets through training he'll be able to smile, like the rest of that outfit, who seem to take naturally after J. Don Alexander who always signs his letters "with a smile." I've often wondered if he was laughing with me—or at me.



Paul Carpenter

But there's no doubt at all about this bird, Paul. He isn't laughing with or at anybody. I think he's just had an argument with his checked jacket. It takes a strong, determined man to cope with a garment like that, and subdue it to good behavior. And even a lad as stout as Paul never knows when the thing may leap up and bite him.

DO you know Inspector W. A. Brooke of the Department of Commerce? I told him to drop me a line and tell me some news for this page. He replied, "I believe there are so many pilots who have had experiences which are so much more interesting than one or two that I might mention, that I would rather read of theirs than relate mine." Now if every pilot feels that way, where is the news to come from? Perhaps the modest lad is afraid that if he says anything in print some wretched fellow will refer to him as the Babbling Brooke!



Eddie Rickenbacker in "Back To The Nursery". *Times Wide World photo.*

LIEUTS. Allan P. Flagg and R. H. Harrell of the Bureau of Aeronautics, U. S. N., made an interesting trip from Anacostia, D. C., to San Diego, Cal., last winter in a Vought Corsair Observation plane, with Pratt and Whitney Wasp. The flight consumed 27½ hours' flying time, by way of Winston Salem, Atlanta, Pensacola, New Orleans, Lake Charles, La., San Antonio, Dryden, El Paso, and Tucson.



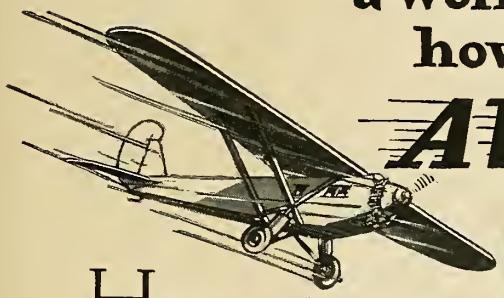
A. P. Flagg

"The experience gained from one such flight with such a wonderful ship and engine cannot be compared to a hundred hours around an airdrome," writes Lieut. Flagg. Which is perfectly true. The hours and hours of flying time piled up at the home field is merely so much monotony, but a cross-country, especially to some new destination, is always interesting and instructive. Especially so if they run into bad weather. If Flagg had stayed around an airdrome he never would have enjoyed this little bit. "About 20 minutes from Atlanta we ran into heavy rain which continually fouled our goggles so that we could see only with difficulty. The clouds were low, and the smoke of Atlanta was very bad, so much so that it was almost impossible to make out the railroad tracks less than 100 feet below. The rain continued, and although we knew from the blast furnaces that we were over the eastern part of the city, the visibility was so poor that we could not make out any buildings or landmarks to find the field, in spite of the fact that both of us had been over the field on a previous trip. We continued our search, meanwhile making passes at every spot where we thought we might make a safe landing, but there just weren't any spots like that. The rain continued and the situation rapidly became acute, and I thought we might have to jump if we didn't get down any other way. The engine, however, continued to run perfectly in spite of the downpour." They were running short of gas, with no field in sight, but "as a last chance we decided to go back to the city and look again for the field. In a blind guess at direction and distance, all of a sudden from under our right wing, up hopped the field. Needless to say we were more than pleased to see it."

You bet they were! Smoke, fog, and heavy rain are unpleasant companions and best avoided. I was talking to Harry Rogers the other day, and he was telling me about getting caught in a thunderstorm that threw him upsidedown, sideways, and around, and nothing in sight but black cloud illuminated by lightning. Some fellows pretend to like that sort of thing—*yes* they do!

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40

Jobs on the Ground for Each One in the Air

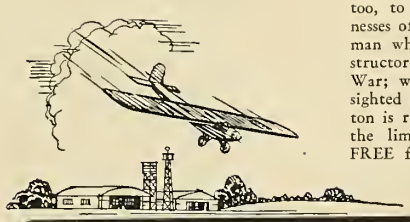
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A merchandising organization that, in eight months of active operation, has put on a paying basis the sale of the products and services of more than two-score outstanding aviation companies.



Air Associates' City Sales Room

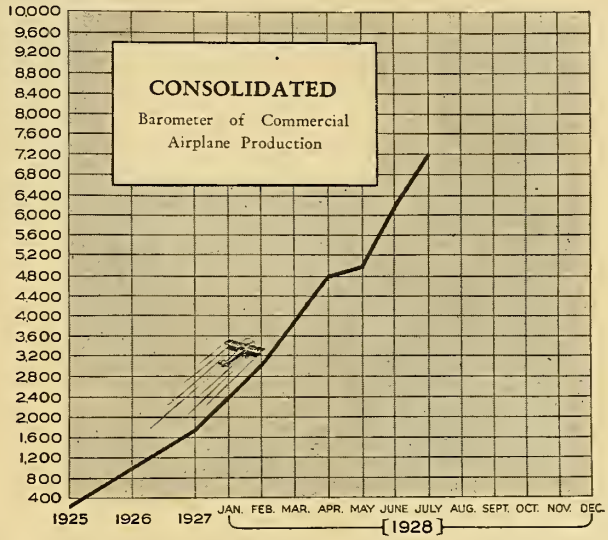
"The Aviation Clearing House"

Fifth Avenue (44th St.)

Curtiss Field (L. I.)

NEW YORK

THE accompanying chart visualizes the constant growth of airplane production . . . and the present approximate rate of manufacture (planes per 12-month period) . . . as indicated by the current delivery schedule of Consolidated Instruments.



Consolidated Instrument Panel Standard on CURTISS "ROBIN"



TYPE F Star Pathfinder compass, flush mounting, with easily accessible compensating unit.

CONSOLIDATED INSTRUMENTS

Altimeters
Tachometers
Oil Pressure Gauges
Compasses
Temperature Gauges
Air Speed Indicators
Instrument Panels
Gasoline Gauges
Fuel Strainers
Inclinometers
Clocks
Navigation Lights
Landing Lights
Dash Lights
Air Pressure Gauge

THE "Robin," Curtiss' initial venture in quantity production of commercial airplanes, is equipped with the Consolidated Type A Aircraft Instrument Panel. In standardizing on this attractive, indirectly illuminated unit, Curtiss has provided up-to-the-minute advantages for those who will fly these graceful, flashing ships.

More and more, leading aircraft manufacturers are adopting this recently developed Consolidated Panel as the most convenient and efficient instrument equipment for their planes.

One or more Consolidated Instruments is standard equipment on most American commercial airplanes.

Air Associates, Inc., carry a complete stock of Consolidated products at their Curtiss Field Hangar, Garden City, Long Island, N. Y. They are installing there a compass rose for compensating Consolidated (Star Pathfinder) compasses.

CONSOLIDATED
Instrument Company of America, Inc.

41 East 42nd St., New York



CONSOLIDATED aircraft instrument panel Type A, indirectly illuminated.

Western Representative—M. E. Hulse, 5391 Broadway, Oakland, Calif

AIR ASSOCIATES
HAVE METHODIZED AVIATION COMMERCE

WITH the present month Air Associates rounds out the personnel and policies which have developed this company from an idea in 1926 to a corporation in 1927, and in 1928, to the leading aviation distributing organization of the East. In a bare eight months of active operation they not only developed a complete sales service but have helped to hasten the realization, by the public as well as by the industry, of methodized aviation commerce.

To take full advantage of the interrelated phases of commercial aviation, a complete sales system must include both service and products. With studied regard to the industrial future, therefore, Air Associates have developed (1) a business bureau handling passenger service, flying instruction, engineering counsel, aviation insurance, publications, aerial advertising, and manufacturers' displays; and an equipment and supply depot selling every product for which there is a steady demand.

Having successfully established a city salesroom, at 535 Fifth Avenue, New York, the next step was the "field store"—and the Curtiss Field sales hangar of Air Associates is the first in a chain of systematized supply bases to be placed throughout the East by this corporation. At such depots the pilot and operator secure efficient storage, fuel, engine service, plane repairs, and immediate supply of accessories and equipment.

Air Associates have contracted with three manufacturers of airplanes in non-competing classes to distribute these planes in the Eastern states. The ships are the Whirlwind Lockheed Vega, of Wilkins' Polar fame, built by the Lockheed Aircraft Company of Los Angeles, the Cirrus-engined Avro Avian, flown in record time (sixteen days) from England to Australia, and used successfully throughout the British Empire, manufactured by A. V. Roe & Company, Ltd., and the Driggs Dart, the low-priced two-



place sport plane designed and built by Ivan Driggs of Lansing, Michigan.

Between the city salesroom and the field station, a constant liaison is maintained. Customers enjoy the facility of information and consultation at a convenient office and are properly transported to the field for inspection and demonstration. The possibilities for the development of sales efficiency are apparent. Sales of eight types of planes were effected during the last quarter of operations.

The new company's progressive operations have accordingly constituted a barometer of increase in the aircraft business. Sales volume, turnover in a strict economic sense, has demonstrated the soundness of the clearing house idea.

Air Associates have just contracted with the Wright Aeronautical Corporation to act as their authorized dealers for spare parts within one hundred miles of New York. As dealers they will undertake the problem of servicing Wright engines in this territory as rapidly as the field organization may be developed while a complete line of Wright parts will be maintained at Curtiss Field at all times.

Further representations for this territory include E. B. Meyrowitz; Beck Distributing Company; Canvas-Leather Specialty Company; Irving Air Chute Company; H. D. Lee Mercantile Company; Albertson & Company; J. H. Williams Company; Forged Steel Products Company; Perry-Austen Manufacturing Company; Hamilton Aero Mfg. Company; E. S. Twining & Company; Chas. Fischer Spring Company; Coston Supply Company (Ball Crank

(Continued on page 69)



The New York City salesroom office of Air Associates where an information and service bureau is maintained.

Announcement

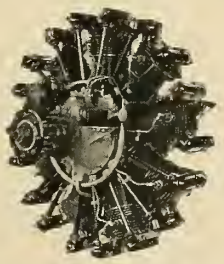
THE remarkable growth of aviation during the past year is reflected in the greatly increased use of Wright engines. For the convenience of hundreds of users of Wright engines we have appointed Air Associates, Inc. an authorized Wright parts dealer. They will carry a complete stock of genuine Wright parts at all times.

In addition, Air Associates, Inc. are equipped to render prompt and efficient service on repair and replacement work.

WRIGHT AERONAUTICAL CORPORATION

Paterson, N. J. U. S. A.

CANADIAN WRIGHT LIMITED, Sole Licensees for Canada, Montreal



AUTHORIZED PARTS DEALERS

Air Associates, Inc.—*Curtiss Field, Long Island, N. Y.* Pacific Aeromotive Corp.—*Los Angeles, Cal.* Stout Air Services, Inc.—*Dearborn, Mich.*

The choice of Aviation



MEYROWITZ LUXOR GOGGLE
U.S. Air Service Model No. 6

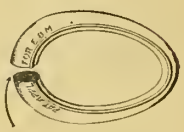
In protective aluminum case, $10.75

When a group of men as particular as aviators decide overwhelmingly in favor of one certain piece of equipment, you may be sure that quality and performance are there. So when most of the leading flyers insist on Meyrowitz Luxor Goggles, the choice of aviation is known.

Performance and quality are the two important specifications for aeronautics. In both, Meyrowitz Luxor Goggles excel. But Meyrowitz has added another feature that aviators want . . . comfort.

The two features that make these famous goggles perform so perfectly are the ventilator system and the asymmetrical sponge rubber cushions. Both are patented and are found in no other goggles. No air seepage . . . no fogging or sweating . . . no pressure on your face . . . will not roll.

Built by opticians with years of constant research behind them as scientifically as microscopes. For sale at airports, flying schools, opticians, sporting goods stores. If you are unable to get the genuine, write directly to us.



Showing the asymmetrical sponge rubber cushion (patented) which provides perfect comfort and fit and prevents air seepage.

PRICES

U. S. Air Service No. 7

With white cylindrical bent lenses (Illustrated)	$13.75
With tinted cylindrical bent lenses	15.75
With white hand ground meniscus lenses	18.00
With tinted hand ground meniscus lenses	19.50
With white hand ground cylindrical lenses, U. S. Army specification No. 3024	20.00

U. S. Air Service No. 6

With white cylindrical bent lenses	$10.75
With tinted cylindrical bent lenses	12.75
With white hand ground meniscus lenses	15.00
With tinted hand ground meniscus lenses	16.50

Regular Model 6

With white cylindrical bent lenses	$9.75

Luxor Model 5

With white cylindrical bent lenses	$7.50

Tinted Lenses

Meyrowitz Luxor Goggles are made with amber euphos (green) and smoke tinted lenses as desired. Also special lenses conforming to U. S. Army and Navy specifications. Lenses accurately ground to prescription can be fitted in any model.

Distributor's Plan

Write for details about our Distributor's Plan. Meyrowitz Luxor Goggles are in demand everywhere. Managers of airports, flying schools, and aircraft dealers should avail themselves of this profit-making opportunity.

Send for 1928 catalog

Pioneers in the development of goggles to meet the special requirements of aviation

E. B. Meyrowitz
Established 1875 INCORPORATED
and Associated Companies

520 Fifth Ave., Dept. A, New York

Minneapolis St. Paul Detroit London Paris

Luxor Goggles may be selected and fitted at AIR ASSOCIATES, Inc., Retail Agents, 535 5th Ave., or Curtiss Field, N. Y.



THE DOUBLE DUTY OF TIRES



THE opened throttle commands airplane tires to be fleet and nimble, to spin easily and swiftly as the ship hurries into flight.

And then, the journey over, these same tires must bear speeding weight and human life to safety as the plane strikes ground again.

Thus, in every flight Goodyear Airplane Tires reveal their agility and their strength. These tires assist take-off performance because they are perfectly balanced and hold their proper pressures. They withstand the punishment of fast or awkward landing because they are built of finest materials by men who know how important tires are to safety.

Goodyear Airplane Tires are offered by an organization that wants aviation to prosper. Goodyear makes everything in rubber for the airplane.

Aeronautics Department

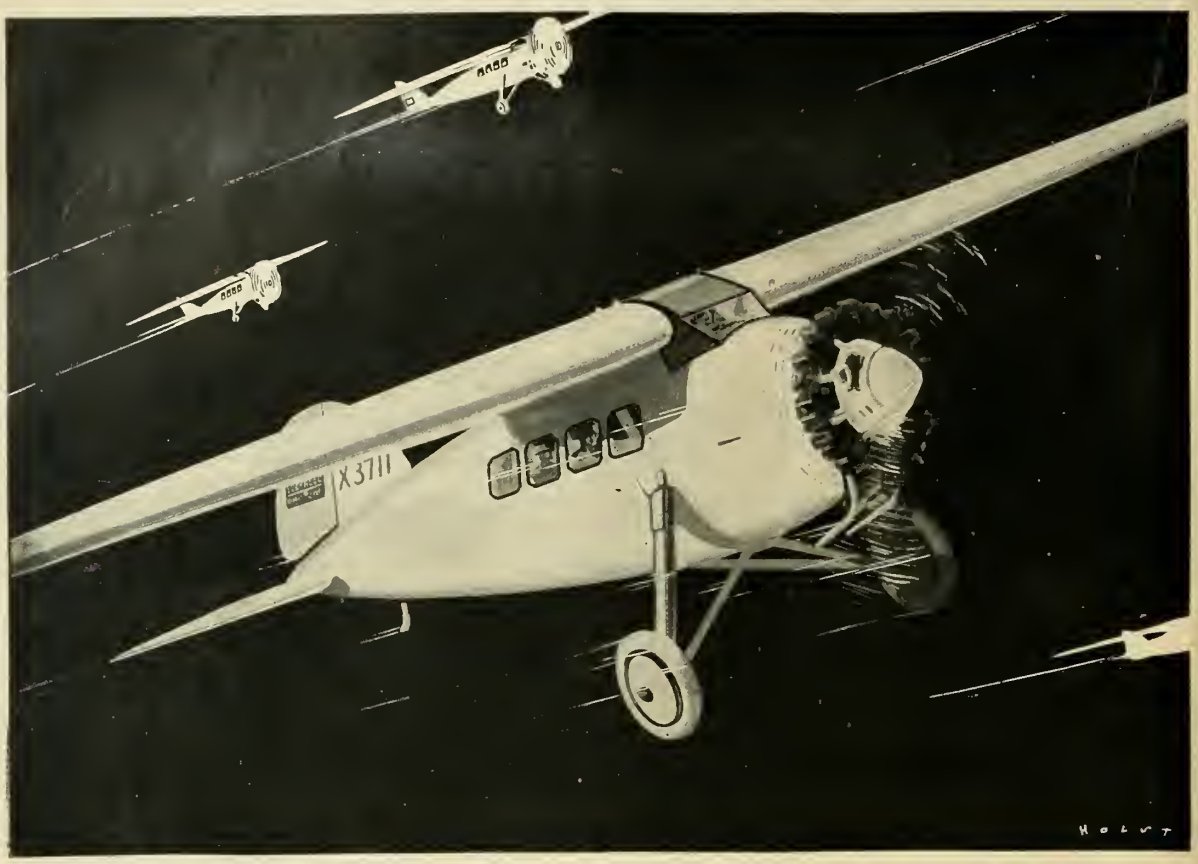
THE GOODYEAR TIRE & RUBBER COMPANY, INC., AKRON, OHIO

GOODYEAR

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AIRPLANE TIRES

AIR ASSOCIATES, INC.
are authorized to supply you
with GOODYEARS through their Curtiss Field store



COMMERCIAL AIRPLANES WITH A FIGHTING PERFORMANCE!

Lockheed Vega
(*Wasp*)

The fastest five-place cabin airplane in the world. A de-luxe model.

Top speed . . . . . 170 m.p.h.
Cruising speed . . . . 135 m.p.h.
Climb . . . . . 1800 feet per min.
Pay-load . . . . . 1000 pounds
Cruising range . . . . . 750 miles
Fuel consumption . 8 mi. per gal.
Price $18,500.00

Lockheed Air Express
(*Wasp*)

Specially designed and constructed for Mail, Passenger and Express service. Cabin seats four passengers in comfort. Convertible arrangement for two passengers and 100 cu. ft. of mail or express. Performance same as *Wasp* VEGA.

Price $19,500.00
Price with *Hornet* . . $22,500.00

Lockheed Vega
(*Whirlwind*)

Luxuriously appointed cabin monoplane for 4 passengers and pilot.

Top speed . . . . . 138 m.p.h.
Cruising speed . . . . 118 m.p.h.
Climb . . . . . 1000 feet per min.
Pay-load . . . . . 1000 pounds
Cruising range . . . . 1000 miles
Fuel consumption . 10 mi. per gal.
Price $13,500.00

The performance figures given above are made from actual flight tests with full pay-load and are guaranteed to within plus or minus five per cent.

Eastern Distributors

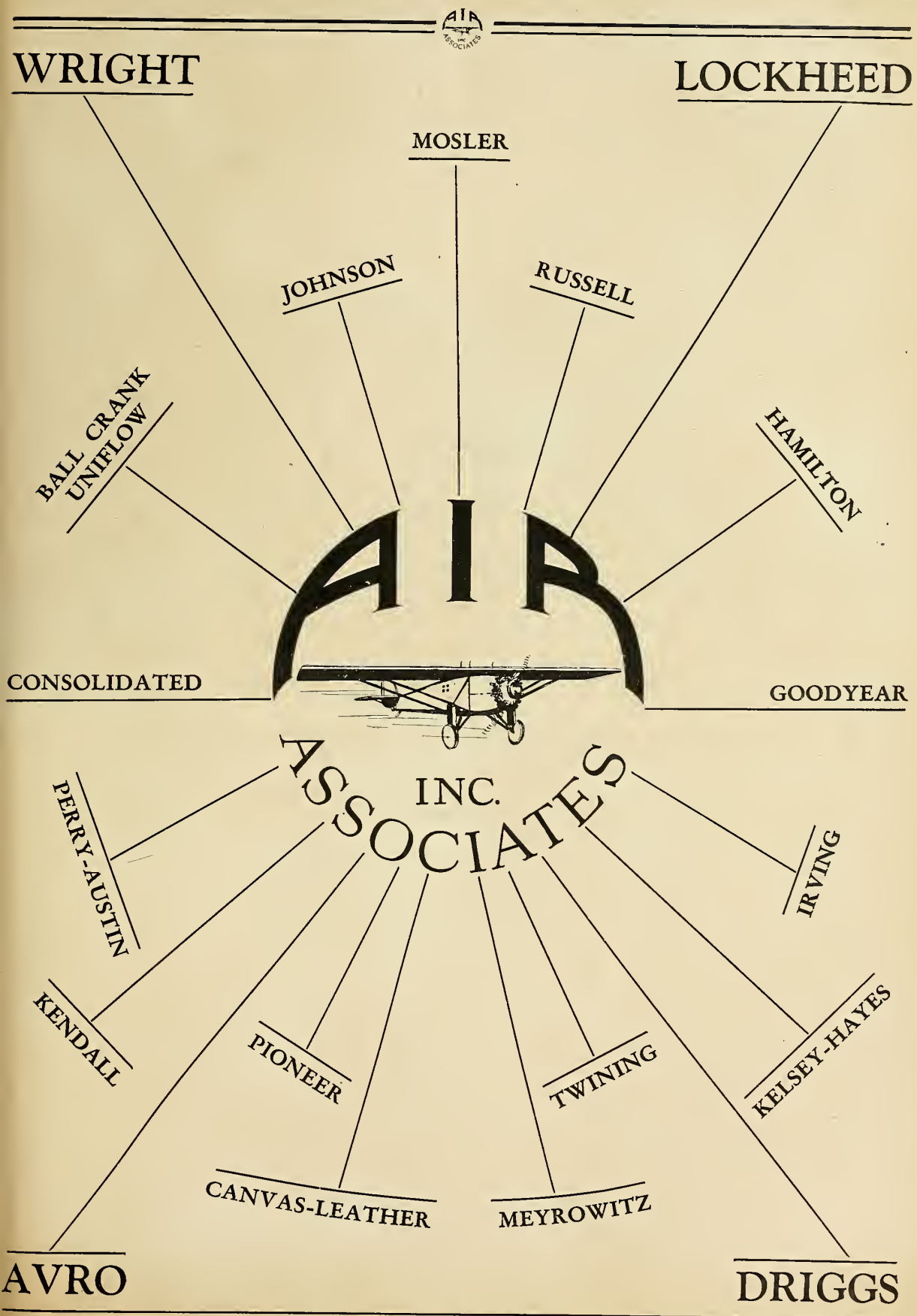
Air Associates, Inc.
535 Fifth Avenue
New York, N. Y.

Hangar 25, Curtiss Field

LOCKHEED
AIRCRAFT COMPANY
LOS ANGELES U.S.A.
REG. U.S. PAT. OFF

General Offices, Factory and Airport, Burbank, Suburb of Los Angeles

All prices are fly-away at the factory Burbank, California


WRIGHT
LOCKHEED
MOSLER
JOHNSON
RUSSELL
BALL CRANK
UNIFLOW
HAMILTON
AIR
CONSOLIDATED
GOODYEAR
ASSOCIATES
INC.
PERRY-AUSTIN
IRVING
KENDALL
PIONEER
TWINING
KELSEY-HAYES
CANVAS-LEATHER
MEYROWITZ
AVRO
DRIGGS

AVRO AVIAN
with
HANDLEY-PAGE Slotted Wings
by special arrangement

The famous AVIAN made promptly available to American fliers by AIR ASSOCIATES, Inc.



Flown by Bert Hinkler in 16 days from England to Australia

The Up-To-Date Sport Plane

THE AVRO CIRRUS-AVIAN is the up-to-date light airplane. In its production two lines of development have received special consideration. The first, elimination, by the introduction of an undercarriage of unique design, of the danger of damage to the machine in the event of landing on unprepared ground; the second, the special attachment of Handley-Page automatic wing slots.

The development of these features has placed the AVIAN far ahead of all other light airplanes. Cardinal features of the AVIAN are: Simplicity of construction; Great structural strength; Reliability; Small housing space; the most remarkable value in the airplane world.

There are many exceptional features, some of which will be dealt with in future advertisements. In the meantime, full details will be gladly sent on request.

Fully equipped, Flyaway Curtiss Field, L. I., at two weeks' notice. Details on request.

AIR ASSOCIATES, INC.
535 FIFTH AVENUE, NEW YORK CITY

Distributors for Eastern United States

A. V. ROE & COMPANY, LTD., MANCHESTER, ENG

S. S. M. A. MICA SPARK PLUGS

are the result of many years of intensive development by men who have specialized in the ignition requirements of aircraft engines.

S. S. M. A. SPARK PLUGS fit all approved type air-cooled aircraft engines. They have proved their ability to stand extreme wear by passing successfully the most rigid tests. They have three times the life of ordinary porcelain plugs.

The adjustable gap is another feature that will appeal to all aircraft operators and to the men whose job is—

"To keep the engines running"

MOSLER IGNITION COMPANY

30 University Place, New York, N. Y

Stuyvesant 8661-6077

Air Associates, Inc., exclusive Eastern distributors

Complete stock carried at all times



re: Lubrication at Curtiss Field



KENDALL Penzbest, the Motor Oil that is breaking all records for its ability to stand up under continued use many hours after ordinary oils break down, is supplied by the Lubrication Service of Air Associates, Inc., at Curtiss Field, Long Island.

"Ever since our selection of Air Associates, Inc., as our representatives for sales and service at Curtiss Field, Long Island, our experience with this organization has been highly satisfactory. In point of personnel, facilities and the willingness to render a high type service we commend Air Associates, Inc., to all flyers."

Kendall Refining Company.

Kendall Penzbest Oil is derived from 100% pure Bradford, Pa., crude—the world's finest. Its use not only prolongs the draining intervals but its high viscosity, with the ability to circulate freely, gives better motor lubrication at all times. Test after test has demonstrated that engines lubricated with Kendall Penzbest make more revolutions, develop greater speed. Specify Kendall "G" for planes under 200 h.p.; "J" for over 200 h.p.

KENDALL REFINING CO.
BRADFORD, PA.

"In servicing various types of planes at our Curtiss Field hangar, our lubrication staff invariably recommends Kendall Penzbest Oil. The splendid performance of Kendall Penzbest, as attested to on numerous occasions by pilots we have served, confirms our belief that it is the finest lubricating oil for aviation purposes."

Air Associates, Inc.

KENDALL PENZBEST MOTOR OIL



THE WORLD'S MOST POPULAR AIRPLANE FABRIC CHOSEN FOR DURABILITY AND LONG WEARING QUALITIES

Distributors:

AIR ASSOCIATES
535 FIFTH AVE., N. Y. C.

LOGAN AVIATION CO.
CLEVELAND, OHIO

JOHNSON AIRPLANE & SUPPLY CO.
DAYTON, OHIO

NICHOLAS BEAZLEY AIRPLANE CO.
MARSHALL, MO.

PACIFIC AEROMOTIVE CORP.
LOS ANGELES, CAL.

AIRPLANE DESIGNERS SPECIFY
FLIGHTEX

AIRPLANE MANUFACTURERS USE
FLIGHTEX

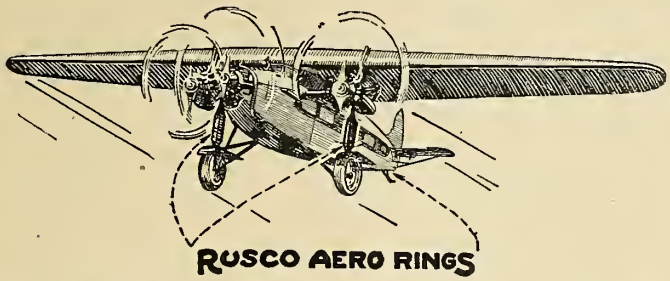
AIRPLANE PURCHASERS REQUEST
FLIGHTEX

NOTE: *Your Plane When Covered With FLIGHTEX Has An Added Distinction of Quality.*

E. S. TWINING & CO.
320 Broadway, N. Y. C.

RUSCO AERO RINGS AGAIN!

This time on the Southern Cross



Like all Fokker Trimotor ships, the Southern Cross had Rusco Aero Ring shock absorber suspension. Repeated take-offs and landings, bearing phenomenal loads, called for a staunch landing gear.

Curtiss, Stinson, Bellanca, Cessna, American Eagle, are some of the other prominent aircraft manufacturers using Rusco Aero Rings.

To EASTERN and Visiting Pilots: A complete line of Rusco Aero Products are available at the Field Store of Air Associates, Inc., at Curtiss Field, Long Island, New York.

We solicit your inquiries. Write for circular of Rusco Aero Products.

THE RUSSELL MANUFACTURING COMPANY

FOUNDED 1830

Sales Office—349 Broadway, New York City
Factory—Middletown, Conn.

RUSCO
AERO PRODUCTS

Cords
Shock Absorber, Instrument Mounting, Parachute Pack Opening, Balloon Valve, Glider Sling.

Rings
Aero Rings, Landing Gear, Tail Skid.

Safety Belts
U. S. Army and Navy Spec. 5″ and 3″ width.

Braids
Parachute Shroud Line.

Lacings
Panel, fuselage.

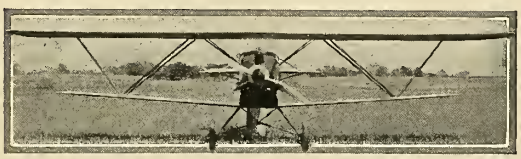
Tapes
Reinforcing, all widths.

Webbing
Elastic—Streamline Gap Covers.
Non-elastic—Cotton and Linen — Parachute Harness—Shims, Tank Strap, All Sizes — Tensile Strengths up to 12,000 lbs.

Brake Lining

DRIGGS DART II

In the East



The new Driggs Dart II will be demonstrated by appointment by Air Associates, Inc., at Curtiss Field, Long Island.

Appointments can be made either at Air Associates, Inc. Hangar, Curtiss Field, or at the New York sales room, 535 Fifth Avenue.

The Driggs Dart II is equipped with the 3-cylinder, new, improved Anzani Engine of 40 h.p. Price, $1900, Flyaway, Lansing, Michigan.

The Driggs Dart II, equipped with the 6-cylinder, 60 h.p. Anzani, is also available. Price, $2485, Flyaway, Lansing, Michigan.

DRIGGS AIRCRAFT CORP.

Lansing, Michigan

AIR ASSOCIATES, Inc.
EASTERN DISTRIBUTORS

535 Fifth Avenue
New York

Hangar at Curtiss Field
Garden City, Long Island

A HANGAR WHEREVER YOU LAND!

There is only one way to be sure of it—take your hangar with you.

THE FORRESTER HANGAR

PORTABLE BY PLANE

FIREPROOF — WATERTIGHT

Rolled—Will slip into the cockpit of your ship.

Pitched—Will stand in any weather. Complete with collapsible poles, guys and steel stakes, a hangar for the "Waco Type" of plane weighs only 110 pounds.

Manufactured by

FORRESTER EQUIPMENT CORPORATION

42 Warren Street
New York, City

Full Particulars from Manufacturer, or
AIR ASSOCIATES, INC.
535 Fifth Ave. Curtiss Field
New York
EASTERN DISTRIBUTORS
Other territories open

SNAPPY-SNUG FLYING CLOTHES

YOUR "Flying Wardrobe" can be quickly and easily replenished with "Snappy-Snug Flying Clothes" at the Field Store of Air Associates, Inc., Curtiss Field, Long Island, New York. A complete line of Snappy-Snug items always on display and available over the counter.

Snappy-Snug Flying Clothes are worn by Army and Navy pilots and well known commercial pilots. Designed and made to meet every requirement for comfort and wear.

Write for Booklet "A," for complete information and description of our "Flying Wardrobe."

CANVAS-LEATHER SPECIALTY COMPANY
755-59 Cass St. Trenton, N. J., U. S. A

FLY *with SAFETY!*

Far-sighted pilots, air line operators and aeronautic authorities agree that *safety* is the most important factor for the future development of aviation. *The great general public will "take to the air" as soon as it understands that it can* SAFELY LAND, even . . .

"if the engine stops"
or
"if something happens"

To give the public *confidence*, and the greatest possible guarantee of safe descent, many progressive manufacturers and operators are recommending and adopting Russell "Lobe" Parachutes as standard safety equipment.



FOR SAFE DESCENT

This modern device gives positive rapid opening without excessive shock load. It operates safely at low altitudes—and gives excellent performance, even when packed by inexperienced persons. 100% manually operated. No rubber bands, no springs, no pilot chute.

Made of silk or cotton; prices $250 to $350, complete with carrying bag.

Descriptive Folder on Request

EXCLUSIVE DEALER FRANCHISES NOW AVAILABLE !

We are appointing exclusive dealers in every state in the Union. Write NOW for folder outlining our attractive proposition for your state.

RUSSELL PARACHUTE COMPANY
1202 Kettner Blvd. San Diego, Calif.

AIR ASSOCIATES HAVE METHODIZED AVIATION COMMERCE

(Continued from page 58)

Uniflow Lubricators); Mosler Ignition Company; A. C. Spark Plug Company; Goodyear Tire & Rubber Company; Russell Manufacturing Company.

Incidental transactions effected by Air Associates, Inc., include an airport development and hangar erection at Manchester, Vermont; importation of the first De Havilland Moth airplane equipped with Handley Page slotted wings; development of the first complete foreign and domestic air travel service: sales representation of the aerial photographic companies, and institution of a technical employment service.

The company has associates in Los Angeles, Chicago, Cleveland, and Boston, and maintains relations with correspondent companies in South America, England, France, and Germany.

Air Associates is controlled by an active directorate, three of whom are officers of the company. H. B. Page is president and bureau manager; J. B. Taylor, Jr., is vice-president and test pilot; Beauregard Sweeney is treasurer and sales executive; F. L. Hill is field manager; L. W. Stotesbury is counsel.

Corporate personnel also includes Gilbert Colgate, Jr., Henry Rogers Benjamin, Walter E. Meyer, Arthur M. Hess, George B. Post, Frank G. Tallman, Jr., Newton T. Peck, D. R. Nichols and S. S. Pond.

Associate engineers are Alexander Klemin, head of the Guggenheim School of Aeronautics, New York University; C. Fayette Taylor, assoc. prof. of aeronautics at M. I. T., and power plants expert of the N. A. C. A.; and Kenneth M. Lane, chief plane engineer, Wright Aeronautical Corp.

PERRY AUSTEN

ACETATE NITRATE **DOPES** CLEAR PIGMENTED

A complete line of our dopes and airplane finishing materials available at the field stores of Air Associates at Curtiss Field, Long Island.

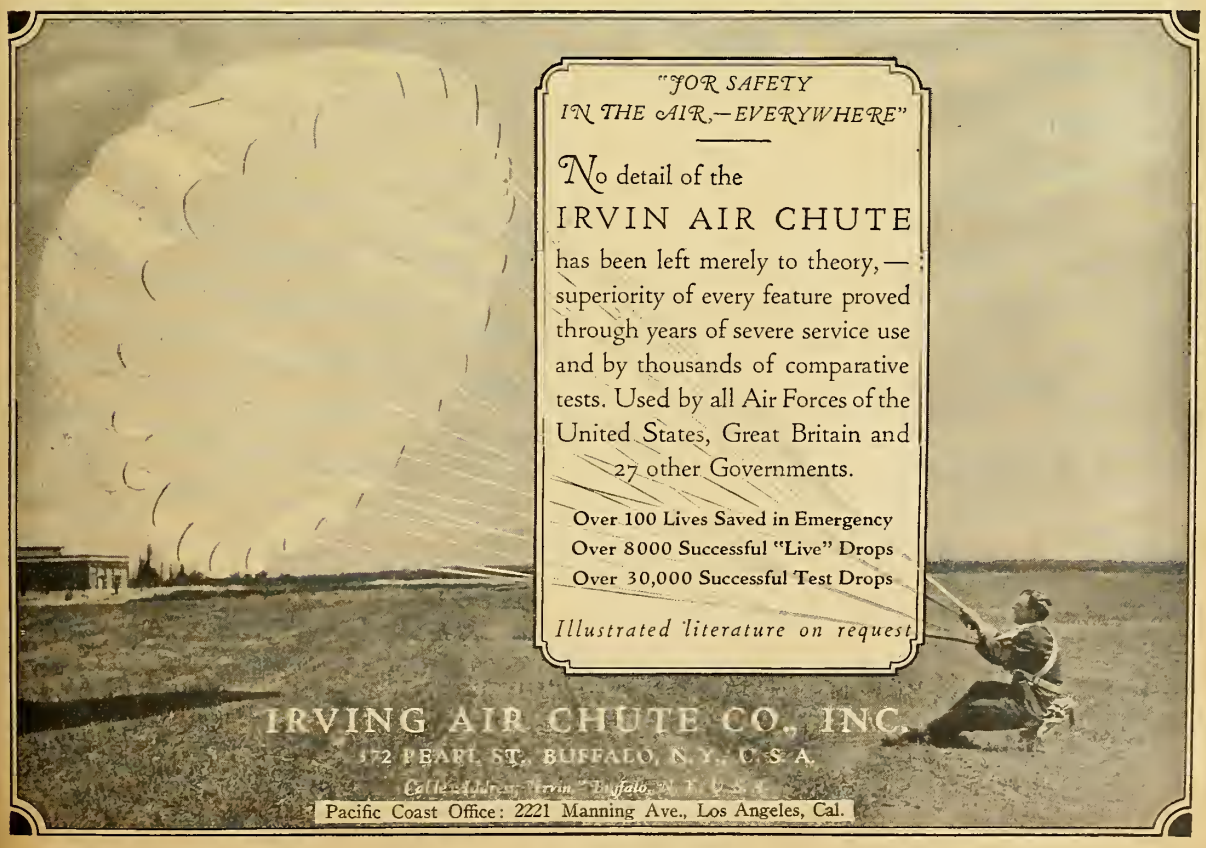
PERRY-AUSTEN MFG. CO.

STATEN ISLAND NEW YORK

Contractors to United States Government

For your convenience

YOU can obtain the latest issues of AERO DIGEST at the Air Associates New York City office or at their hangar at Curtiss Field, Long Island.



ON FIFTH AVENUE (44th St.)

AIR INC. ASSOCIATES

AT CURTISS FIELD (L. I.)

Facilities that mean . . . .

SALES	SERVICE
Lockheed Vega	Wright Engine Parts
Avro Avian	Kendall Penzbest
Driggs Dart	Tidewater Aviation Gas
Irving Air Chutes	Ball Crank Uniflows
Russell Parachutes	Coston Flares and Signals
Consolidated Instruments	Johnson Aero Supplies
Pioneer Instruments	Beck Flying Togs
Goodyear Tires	Forged Steel Products
Hamilton Propellers	Fischer Springs
Kelsey-Hayes Wheels	Russell Shock Cord
Mosler Mica Plugs	Fairchild Aerial Views
Twining Flightex	Curtiss Flying Service
Meyrowitz Luxors	Rogers Airlines
Canvas-Leather "Snappy-Snugs"	West Indian Aerial Express

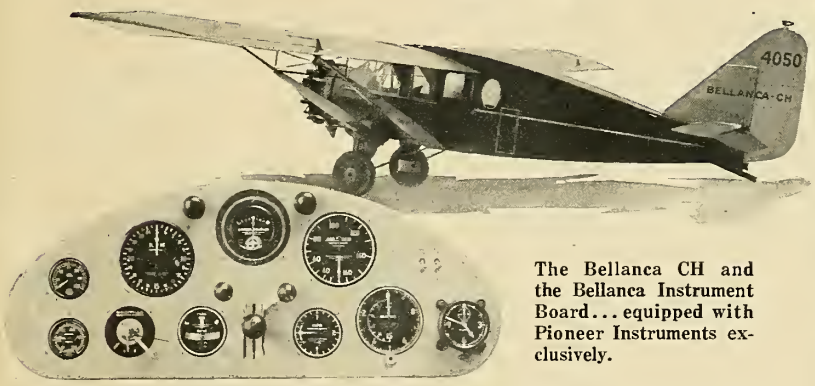
"The Aviation AIR INC. ASSOCIATES Clearing House"

NEW YORK

AIR ASSOCIATES, Inc.

PIONEER Instruments On Bellanca Aircraft

Are Exclusive and Standard Equipment



The Bellanca CH and the Bellanca Instrument Board... equipped with Pioneer Instruments exclusively.

Since 1908 Bellanca Aircraft have been favorably known. Three times Bellanca planes have ranked first in efficiency in the Aviation Town and Country Club of Detroit Race. A Bellanca holds the non-stop distance record. A Bellanca will accompany Byrd to the Antarctic. Aircraft bearing the Bellanca name have achieved notable records for endurance and efficiency everywhere.

The increasing demand for Bellanca aircraft is evidence of the *quality* of these ships. It is natural, then, that for many months past the majority of instruments in Bellanca planes have been Pioneer.

And now Pioneer Instruments, *exclusively*, are installed. Moreover, the following instruments are standard equipment:

Oil Pressure Gauge	Air Speed Indicator
*Oil Temperature Gauge	Magnetic Compass
Altimeter	Tachometer
	Clock

* Manufactured by Molo Meter; distributed by Pioneer

Ask for complete information about any Pioneer Instrument in which you are interested. When you write, please check your interest in aviation.

☐ Operator ☐ Dealer ☐ Pilot
☐ Manufacturer ☐ Designer ☐ Owner

The PIONEER LINE

Check the items in which you are interested, tear out the list, mail it to us, and we will send descriptive folders.

Air Distance Recorder	☐
Air Speed Indicator	☐
Altimeter	☐
Batteries	☐
Climb Indicator	☐
Compass, Magnetic	☐
Earth Inductor Compass	☐
Engine Gauge Unit	☐
Flares	☐
Flight Indicator	☐
Fuel Level Gauge	☐
Fuel Pressure Gauge	☐
Fuel Strainer	☐
Hand Fuel Pump	☐
Holt Flares	☐
Lamps, Instrument	☐
Landing Lights	☐
Navigation Lights	☐
Octant	☐
Oil Pressure Gauge	☐
Power Fuel Pump	☐
Refueling Pump	☐
Sextant	☐
Speed and Drift Meter	☐
Tachometer	☐
Tachometer Shaft	☐
Thermometer	☐
Turn Indicator	☐
Watch	☐
Wiley Flares	☐

PIONEER INSTRUMENT COMPANY
754 LEXINGTON AVE. BROOKLYN NEW YORK

639 SO. SAN PEDRO, LOS ANGELES - 15 SPEAR ST., SAN FRANCISCO - 97 BOULEVARD ST. MICHEL, PARIS - STERNPLATZ 4, JOHANNISTHAL-BERLIN
45 JARVIS ST., TORONTO - - *General European Representative* - - M. CALOERARA - - 11 BIS RUE MONTAIGNE - - PARIS - - FRANCE

Pioneer Instruments and Equipment are sold by Air Associates, Inc., 535 Fifth Avenue, New York City and Curtiss Field, N. Y., and by airplane distributors and dealers everywhere.

Say you saw it in AERO DIGEST

THE DETROIT AIR-OLYMPICS

FOUR major events are scheduled for the program of the Detroit Air-Olympics to be staged at Ford Airport on June 30. They are the National Air Tour, the Gordon Bennett International Balloon Race, the National Model Airplane Contest, and an exhibition of glider flying. The American Society of Mechanical Engineers' Convention will hold its sessions June 28th to 30th.

1928 NATIONAL AIR TOUR for the Edsel B. Ford Trophy

MORE than a score of commercial airplanes of the latest models will compete for the Edsel B. Ford trophy, the chief prize of the 1928 National Air Tour which will begin at 10:00 a. m., June 30, its 6,000-mile swing around the country. The rules and regulations governing the tour were published in the June issue of AERO DIGEST.

The air tour entries range from two-seater, single engined biplanes of the mail-carrying type to the huge tri-motored, all metal monoplanes built to carry more than a dozen passengers at each trip. Three of the latest type Ford all-metal three motored monoplanes will accompany the tour. These planes will be operated by the Texas Company, the Standard Oil Company of Indiana and the Standard Oil Company of California. The official entry of the three will be the Texas Company's ship, which has been entered by the manufacturer as is required by the rules of the tour. It will be operated by its regular crew. The plane of the Standard Oil Company of Indiana will accompany the tour in the earlier stages, but will drop out in the far west, where the plane of the Standard Oil Company of California will join the flight.

The tour this year will cover approximately 6,000 miles and will touch important cities in the Middle West, Southwest, Pacific Coast and Northwest sections of the country.

Thirty-two cities will be visited by the airplanes in this year's tour. The official itinerary, with the dates for visiting each city, is as follows: Indianapolis—June 30th; St. Louis—June 30 to July 2; Springfield, Missouri—July 2; Wichita—July 2 to 3; Tulsa, Oklahoma—July 3 to 5; Fort Worth, Texas—July 5 to 7; Waco—July 7; San Antonio—July 7 to 9; Marfa—July 9; El Paso—July 9 to 10; Tucson, Arizona—July 10 to 11; Yuma—July 11; San Diego, California—July 11 to 12; Los Angeles—July 12 to 14; Fresno—July 14; San Francisco—July 14 to 16; Corning—July 16; Medford, Oregon—July 16; Portland—July 16 to 18; Tacoma, Washington—July 18 to 19; Spokane—July 19 to 21; Missoula, Montana—July 21;

(*Continued on next page*)

OFFICIAL ENTRY LIST OF THE 1928 NATIONAL AIR TOUR

No.	*Make of Ship*	*Model*	*Type*	*Engine Used*	*Entered by*	*Owned by*	*Pilot*
1	Bellanca	CH	Monoplane	Wright J-5-CA	Wayco Air Service, Inc.	Wayco Air Service, Inc.	William S. Brock
2	Ford Trimotored	4-AT	Monoplane	Wright J-5	Stout Metal Airplane Co.	The Texas Co.	Frank M. Hawks
3	Travel Air	8000	Biplane	Fairchild Caminez	Travel Air Mfg. Co.		George Meissner
4	Eaglerock	CSE	Biplane	Menasco-Salmson	Alexander Aircraft Co.	Alexander Aircraft Co.	Benny Howard
5	Curtiss "Robin"		Monoplane	Curtiss OX-5	Curtiss-Rohertson Co.	Curtiss-Rohertson Co.	Dan R. Robertson
6	Stearman	C3B	Biplane	Wright J-5 AB	Stearman Aircraft Co.	Stearman Aircraft Co.	David P. Levy
7	Buhl "Airster"	CA-3	Biplane	Wright J-5	Buhl Aircraft Co.	Reid, Murdoch & Co.	Alger Graham
8	Buhl "Airsedan"	CA-3C	Sesquiplane	Wright J-5	Buhl Aircraft Co.	Buhl Aircraft Co.	Louis G. Meister
9	Ryan Brougham	B-1	Monoplane	Wright J-5-C	B. F. Mahoney Aircraft Co.	Cleveland Pneu. Aerol Co.	E. W. Cleveland
10	Ryan Brougham	B-1	Monoplane	Wright J-5	B. F. Mahoney Aircraft Co.	Texas Pacific Coal & Oil Co.	Al Henley
11	Challenger	C-3	Biplane	Fairchild Caminez	Kreider-Reisner Co.	Kreider-Reisner Co.	A. H. Kreider
12	Eaglerock	Hispano	Biplane	Hispano-Suiza "E"	Alexander Aircraft Co.	Alexander Aircraft Co.	C. P. Clevenger
13	Mohawk	Pinto	Monoplane	Warner	Mohawk Aircraft Co.	Mohawk Aircraft Co.	Dr. Jos. A. Nowicki
14	Travel Air	9000	Biplane	Siemens-Halske	Travel Air Mfg. Co.	George B. Peck	George B. Peck
15	Fleetwing	R-1	Monoplane	Wright J-5 (2)	C. C. Runkell	C. C. Runkell	C. C. Runkell
16	Ryan Brougham	B-1	Monoplane	Wright J-5	B. F. Mahoney Aircraft Co.	Mutual Aircraft Corp.	Vance Breese
17	Swallow	J-5	Biplane	Wright J-5 AB	Swallow Airplane Co.	Swallow Airplane Co.	Jay Sadowsky
18	Waco	10	Biplane	Wright J-5	Advance Aircraft Co.	Advance Aircraft Co.	John P. Wood
19	Waco	10	Biplane	Wright J-5	Advance Aircraft Co.	Advance Aircraft Co.	Charles W. Meyers
20	Stinson-Detroiter	SM-1-D	Monoplane	Wright J-5 G1B	Stinson Aircraft Corp.	E. A. McIntyre	Edward A. Stinson
21	Stinson-Detroiter Jr.	SM-2	Monoplane	Warner	Stinson Aircraft Corp.	Otto Leisey	Randolph Page
22	Stinson-Detroiter Jr.	SM-2	Monoplane	Warner	Stinson Aircraft Corp.	D. W. Moore	Lewis Steward
23	Lockheed	"Vega"	Monoplane	Wright J-5 C	Lockheed Aircraft Co.	Lockheed Aircraft Co.	Robert Cantwell
24	Fairchild	FC-2	Monoplane	Wright J-5	Fairchild Airplane Mfg. Co.	Fairchild Airplane Mfg. Co.	Richard W. Pears
25	Bellanca	CH	Monoplane	Wright J-5 CA	Wayco Air Service, Inc.	Wayco Air Service, Inc.	
26	Monocoupe	2 place	Monoplane	Velie M-5	Mono-Aircraft, Inc.	Mono-Aircraft, Inc.	Phoebe Fairgrave Omlie



A few of the American commercial airplanes entered in the 1928 National Air Tour

(Top row) Curtiss Robin, Bellanca, Eaglerock, Travel Air (Siemens engine). (Second row) Travel Air (Caminez engine), Fairchild, Monocoupe, Ryan Brougham. (Third row) Swallow, Travel Air, Waco, Stinson Junior. (Bottom row) Ford Trimotor, Stearman, Buhl Airster, Lockhead Vega.

"Butler Steel Hangar--proven very satisfactory"

Says A. D. Stoddard, Chief Engineer
Halliburton Oil Well Cementing Co., Duncan, Okla



THE Halliburton Company has used not only the Butler Steel Hangar referred to above, but other Butler Steel Buildings. This company knows Butler Buildings for the service they give.

Mr. Stoddard states further, "The steel shop building at Duncan, Oklahoma, has proven entirely satisfactory. We find that this Butler Building is light and well ventilated and makes an ideal place to work. In addition to this, if it became necessary we could very easily take the building down and rebuild it at some other point.

"The shop building at Odessa, Texas, has given us equal satisfaction. We have planned this building so that it can be taken down and moved to some other point or so that it can be extended if the need requires.

"We have found that the Butler Bolted Building has a very large salvage value where it might be necessary to move the building after a few years.

"As is often the case, the center of oil activity changes very rapidly and usually a building is of little value after the activity has passed. We therefore feel it to our advantage to use the Butler Building since it can be moved so readily to other points."

Butler Steel Buildings, including Butler Steel Hangars, are fire-resistant. All sheets are 24 gage galvanized steel with deeply paneled corrugations. The sheets are bolted together and to a steel frame with *galvanized* bolts.

The wheels of the hangar doors are equipped with roller bearings and operate easily.

Butler Steel Hangars are complete for one or for many planes.

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(Detroit Air Olympics continued)

Great Falls—July 21 to 22; Froid—July 22; Minot, North Dakota—July 22 to 23; Fargo—July 23; St. Paul—July 23 to 25; Wausau, Wisconsin—July 25 to 26; Milwaukee—July 26 to 27; Chicago—July 27 to 28; Battle Creek, Michigan—July 28, and thence back to the Ford Airport on the same day.

The Edsel B. Ford trophy is offered to the plane making the highest composite score. In 1924 one leg on the trophy was won by Walter Beach, of Wichita. Last year Eddie Stinson, of Detroit, won a leg on the trophy with the highest score in the 1927 tour. To be held outright the trophy must be won three times by a single entry.

In addition to this major prize, there is $12,000 in cash prizes.

GORDON-BENNETT BALLOON RACE

MOST of the great balloon pilots of the world will participate in the Gordon Bennett International Balloon Race scheduled to be held from the Ford Airport on June 30. For two years American pilots have won the coveted Bennett trophy. Another victory would mean permanent possession.

Most noted of all the pilots coming here for the contest is Ernest Demuyter, of Belgium, four times winner of the international race. No other pilot ever has won the Bennett trophy twice.

Two well known pilots will come from France this year, Maurice Bienaime and Georges Blanchet. Bienaime is present holder of the Gordon Bennett distance record, having won the 1912 race.

Alexander Veenstra, Belgium, winner in 1925, again returns to Detroit for another Bennett race. Veenstra and P. Quersin, also from Belgium, were former flying partners but now race as rivals.

Another famous balloonist competing this year is Hugo Kaulen, of Germany, holder of the world's endurance record. Kaulen went up in his home land on December 13, 1913, and was carried rapidly westward by a strong wind. Four days later he landed far up in Russia, after 87 hours of flying in a midwinter gale.

Still other famous balloon pilots will serve as officials of the 1928 race. They are Brig.-Gen. Frank P. Lahm, of the United States army, and Ralph Upson, of Detroit.

Edsel B. Ford will act as official starter for the race, with Phelps Newberry as his assistant. Judges will be Hon. William P. MacCracken, Jr., Hon. Edward P. Warner, and Admiral William A. Moffett.

The complete list of pilots in the Gordon Bennett race is as follows:

United States: 1. Army—Capt. W. E. Kepner, pilot; Lieut. William O. Eareckson, aide. 2. American Business Club of Akron—Clarence A. Palmer, pilot; J. W. Mell, aide 3. Detroit—William C. Naylor, pilot; Russell Wherritt, aide.

Germany: 1. Hugo Kaulen. 2. Ferdinand Eimermacher. 3. Otto Bertram.

France: 1. Maurice Bienaime. 2. Georges Blanchet. 3. Charles Dollfus.

Belgium: 1. Ernest Demuyter. 2. Alexander Veenstra. 3. P. Quersin.

Switzerland: 1. Ernest L. Maag.

Denmark: 1. S. A. U. Rasmussen.

Argentine: 1. Don Eduardo Bradley.

NATIONAL MODEL AIRPLANE CONTEST

THE final events in the outdoor championship of the Airplane Model League of America will be held at Ford Airport, June 29 and 30. In this contest approximately 500 airplane model builders from different cities will compete.

The contestants will be the pick of the 160,000 members of the national organization of air-minded youth created last fall by the *American Boy Magazine*. They will fly their models in indoor and outdoor events or display them in the scale model event in competition for 200 trophies and medals, and $3,000 in cash prizes.

Two of the contestants, the two boys under 21 years of age who make the best showings in the indoor and outdoor contests, will be awarded a trip to Europe. They will visit Ottawa, the capital of Canada, to fly their planes before the Governor General, and later they will exhibit their models at London, Paris, and Geneva. Merrill Hamburg, model expert and secretary of the League, will accompany them.

The boy under 21 who wins the scale model contest held on June 29 will go to the National Air Races at Los Angeles as the guest of the AERO DIGEST. In this event Mr. G. F. McLaughlin of AERO DIGEST will act as a judge at Convention Hall.

The winner of the outdoor contest will be given a year's possession of the National Outdoor Trophy. The indoor champion will gain possession of the Stout Indoor Trophy.



Some of the pilots and passengers entered in the National Air Tour:

1—Cloyd P. Clevenger; 2—John Paul Wood; 3—Jay Sadowski; 4—E. W. Cleveland; 5—Bob Cantwell; 6—Charles W. Myers; 7—J. A. McInaney; 8—B. F. Mahoney, Al Henley and Sam Breder; 9—Edward Botsford, William Stockert, J. Nelson Kelly and M. Gould Beard; 10—Edward F. Schlee and William Brock; 11—J. F. Wallace; 12—George Peck; 13—Mrs. Phoebe F. Omlie; 14—Frank M. Hawks; 15—Eddie Stinson; 16—Benny Howard; 17—Dan Robertson.





Wright Field, Dayton, Ohio, as illuminated by four Westinghouse Airport Floodlight Projectors

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AIR COMMERCE REGULATIONS

Department of Commerce
Aeronautics Branch

Effective as Amended June 1, 1928

(Concluded from June issue)

Chapter 4. MARKING OF LICENSED AND UNLICENSED AIRCRAFT

Sec. 37. Marking of Aircraft, Law of.

*"The Secretary of Commerce shall by regulation * * * establish air traffic rules for the * * * identification of aircraft * * *."* (Sec. 3 (e).)

Sec. 38. Identification Marks for Government and Special Classes of Aircraft.

(A) For aircraft belonging to the Government of the United States identification marks or symbols will be assigned in accordance with arrangements to be made with the affected departments.

(B) Licensed airplanes engaged in racing or experimental work, or specially licensed for other purposes, will be assigned special identification numbers or symbols.

Sec. 39. Identification Marks for Licensed Aircraft.

A licensed aircraft shall bear an identification mark consisting of the license number of the aircraft preceded by—

The Roman capital letter S (meaning State) for aircraft used solely for governmental purposes and belonging to States, Territories, possessions or political subdivisions thereof, and

The Roman capital letter C for all other licensed aircraft.

Aircraft not licensed, but eligible and for which application for license has been filed with the Secretary of Commerce, will be assigned only a temporary number pending the issuance of license.

The letter N must precede the license symbol and numerals on licensed aircraft engaged in foreign air commerce and, at the option of the owner, may precede it on other licensed aircraft. *The identification mark will be assigned to licensed aircraft when the aircraft license is issued, and a separate application is not required.*

Sec. 40. Identification Marks for Unlicensed Aircraft.

(A) Unlicensed aircraft must display, when in flight, an identification mark assigned by the Secretary of Commerce. The mark will be assigned upon the application of the aircraft owner and must be permanently affixed to the aircraft. It will consist of a number only. The nationality mark shall not be made a part of it, nor shall any other letter, design, symbol, or description be added thereto.

(B) On the date of sale or transfer of title of unlicensed identified aircraft the vendor shall report in writing to the Secretary of Commerce, advising the date and place of sale or transfer, and the name and residence of the vendee, and on said date shall return to the Secretary of Commerce the metal plate furnished by the Secretary of Commerce and the identification-mark assignment issued for such aircraft.

(C) Upon such sale the identification mark may be reassigned to the vendee, provided he files an original application for identification mark, in duplicate, with the Secretary of Commerce, requesting such reassignment and attaches to the application the bill of sale or a certified copy thereof.

(D) The vendee may operate such aircraft under the identification mark already assigned for a period of 20 days from the date of filing the application. In no event shall such period extend beyond 30 days from the date of sale.

(E) Between the date of sale and date of posting in the mails or delivery in person to an authorized representative of the Secretary of Commerce of the new application the aircraft is considered unidentified, and its operation will constitute a violation of these regulations.

Sec. 41. Places and Dimensions of Marks.

Identification marks shall be located as follows:

(A) ON AIRPLANES.—On the lower surface of the lower left wing and the upper surface of the upper right wing, the top of the letters or figures to be toward the leading edge, the height to be at least four-fifths of the mean chord; provided, however, that in the event four-fifths of the mean chord is more than 30 inches, the height of the letters and figures need not be more but shall not be less than 30 inches. If the lower left plane is less than one-half the span of the upper left plane, the letters or figures thus described shall be on the under surface of the upper left plane, as far to the left as is possible. In the case of a monoplane the mark shall be displayed on the lower surface of the left wing and the upper surface of the right wing in the manner thus described. The marks shall also appear on both sides of the rudder, of size as large as the surface will permit, leaving a margin of at least 2 inches.

(B) ON AIRSHIPS.—On both sides near the maximum cross section and on the lower under surface of the nose, the height to be equal to at least one-twelfth of the circumference at the maximum transverse cross section of the airship, but it need not exceed 8 feet.

(C) ON BALLOONS.—Twice, near the maximum horizontal circumference, as far as possible from one another, the height to be equal to at least one-twelfth of the circumference of the balloon, but it need not exceed 8 feet.

(D) The width of the letters and figures of all marks shall be at least two-thirds of the height, and the width of the stroke shall be at least one-sixth of the height. The letters and figures shall be painted in plain black type on a white background or in any color on any background, but there must be a strong contrast between the two. The letters and numbers must be uniform in shape and size. A space equal to at least one-half of the width of a letter shall be left between each figure or letter.

Sec. 42. Other Symbols and Marks.

Except with the approval of the Secretary of Commerce, no design, mark, character, symbol, or description shall be placed upon aircraft if said design, etc., modifies, adds to, or subtracts from, or confuses the assigned mark or impairs or destroys its visibility.

Sec. 43. License and Identification Plates.

The license number or identification mark, with the name and residence of the owner, will be inscribed upon a metal plate furnished by the Secretary of Commerce. It must be affixed to the fuselage in a prominent place, but this section shall not apply to public aircraft of the United States used exclusively in the governmental service.

The plate will distinguish on its face between licensed and unlicensed aircraft.

Chapter 5. LICENSING OF PILOTS

Sec. 44. Pilots, Law of.

*"The Secretary of Commerce shall by regulation * * * provide for the periodic examination and rating of airmen serving in connection with aircraft of the United States as to their qualifications for such service."* (Sec. 3 (c).)

"The term 'airman' means any individual (including the person in command and any pilot, mechanic, or member of the crew) who engages in the navigation of aircraft while under way, and any individual who is in charge of the inspection, overhauling, or repairing of aircraft." (Sec. 9 (k).)

*"It shall be unlawful * * * to serve as an airman in connection with any aircraft registered as an aircraft of the United States * * * without an airman certificate or in violation of the terms of any such certificate."* (Sec. 11 (a) (4).)

*"Any person who violates any provision of subdivision (a) of this section * * * shall be subject to a civil penalty of $500."* (Sec. 11 (b).)

Sec. 45. Application of the Law.

For the purpose of this chapter, persons in command of or piloting licensed aircraft in flight will be classed as pilots.

Sec. 46. Classification of Pilots.

Licensed pilots are classed as commercial or private pilots. Commercial pilots are licensed as transport, limited commercial, or industrial pilots. Private pilots are designated as private pilots (without other qualifications) or as student pilots. A person may hold a plurality of licenses, such as a pilot's and mechanic's license. A transport pilot will not be issued other classes of pilot's licenses.

Sec. 47. Privileges and Restriction of Licensed Pilots.

Except as otherwise provided in these regulations, the privileges conferred and restrictions imposed upon licensed pilots are as follows:

(A) Transport pilots may pilot any type of licensed aircraft but not unlicensed aircraft carrying persons or property for hire. Transport pilots shall have all of the privileges of navigating aircraft conferred upon other classes of pilots, which shall include the right to instruct students in the operation of aircraft in flight.

(B) Limited commercial pilots shall have all of the privileges conferred and be subject to all of the restrictions imposed upon transport pilots, except they shall not pilot aircraft carrying persons for hire outside of the areas mentioned in their licenses, nor shall they, for hire, instruct students in the operation of aircraft in flight.

(C) Industrial pilots may pilot any type of licensed aircraft not carrying persons for hire but shall not pilot unlicensed aircraft carrying either persons or property for hire and shall not, for hire, instruct students in the operation of aircraft in flight.

(D) Private pilots, not designated as students, may pilot licensed aircraft but shall not carry persons or property for hire in licensed or unlicensed aircraft. Private pilots designated as students are licensed only for the purpose of piloting licensed aircraft when receiving flying instructions and such student pilots shall not pilot licensed aircraft carrying persons or property for hire or for any other purpose than receiving flying instructions nor within any other area than that specified in their licenses. Private pilots shall not, for hire, instruct students in the operation of aircraft in flight.

Sec. 48. Applications for Pilots' Licenses.

An application for a pilot's license must be filed, under oath, with the Secretary of Commerce upon blanks furnished for that purpose. An applicant for a pilot's license, including a student's pilot license, must appear for a physical examination before a physician designated by the Secretary of Commerce and pass such examination, unless he is exempt under these regulations.

Sec. 49. Character, Age, and Citizenship Qualifications.

An applicant for a pilot's license must be of good moral character. The minimum age requirements are 16 years for private pilots and 18 years for industrial, limited commercial, and transport pilots. A private pilot may be a citizen of any country. An industrial, limited commercial, or transport pilot must be (1) a citizen of the United States, or (2) a citizen of a foreign country which grants reciprocal commercial-pilot privileges to citizens of the United States on equal terms and conditions with citizens of such foreign country, or (3) an alien who has filed his declaration of intention to become a citizen of the United States and advises the Secretary of Commerce of the serial number of such declaration, the date thereof, and the court in which filed. He must diligently and successfully prosecute the naturalization proceedings under penalty of the revocation of his pilot's license and from time to time must keep the Secretary of Commerce advised of the status of such proceedings.

Sec. 50. Flying Experience Requirements.

An applicant must have at least the following flying experience:

(A) TRANSPORT PILOTS.—Two hundred hours of solo flying, of which at least five hours must have been within the last preceding 60 days prior to the filing of the application.

(B) LIMITED COMMERCIAL PILOTS.—The same solo flying required of industrial pilots.

(C) INDUSTRIAL PILOTS.—Fifty hours of solo flying, of which at least 5 hours must have been within the last preceding 60 days prior to the filing of the application.

(D) PRIVATE PILOTS.—Private pilots not designated as students, 10 hours solo flying, of which at least 2 hours must have been within the last preceding 60 days prior to the filing of the application.

Sec. 51. Pilot's Physical Qualification.

The physical examinations provided for herein must be accomplished before the practical and theoretical tests will be given. The qualifications are as follows:

(A) PRIVATE PILOTS.—Absence of organic disease or defect which would interfere with safe handling of an airplane under the conditions of private flying; visual acuity of at least 20/40 in each eye; less than 20/40 may be accepted if the pilot wears a correction in his goggles bringing his vision approximately to normal and has normal judgment of distance without correction (however, in the case of student pilots this will not apply, but if a student has 20/50 in one eye and 20/40 or better in the other, with normal judgment of distance, without correction, he may be accepted if his physical condition is satisfactory, and if his vision can be corrected approximately to normal by goggles); good judgment of distance; no diplopia in any position; normal visual fields and color vision; no organic disease of eye or internal ear.

(B) INDUSTRIAL PILOTS.—Absence of any organic disease or defect which would interfere with the safe handling of an airplane; visual acuity of not less than 20/30 in each eye, although in certain instances less than 20/30 may be accepted if the applicant wears a correction to 20/20 in his goggles and has good judgment of distance without correction; good judgment of distance; no diplopia in any field; normal visual fields and color vision; absence of organic disease of the eye, ear, nose, or throat.

(C) LIMITED COMMERCIAL PILOTS.—The same physical qualifications prescribed for transport pilots.

(D) TRANSPORT PILOTS.—Good past history; sound pulmonary, cardiovascular gastrointestinal, central nervous, and genito-urinary systems; freedom from material structural defects or limitations; freedom from disease of the ductless glands; normal central, peripheral, and color vision; normal judgment of distance; only slight defects of ocular muscle balance; freedom from ocular disease; absence of obstructive or diseased conditions of the ear, nose, and throat; no abnormalities of equilibrium that would interfere with flying.

(E) WAIVERS.—In the case of trained, experienced flyers the Secretary of Commerce may grant waivers for physical defects designated as disqualifying by these regulations when in his opinion the experience of the pilot will compensate for the defect. A waiver once granted will hold indefinitely so long as the defect for which it was granted has not increased or unless canceled by the Secretary of Commerce.

Sec. 52. Exemption from Prescribed Physical Examination.

An applicant for a pilot's license (or its renewal) will be exempt from the physical examination prescribed in these regulations upon filing with the Secretary of Commerce a certified copy of the examination for flying in the United States Army, Navy, or Marine Corps made within six months of the date of filing his application for his pilot's license or its renewal, provided his physical qualifications as shown by such copy of the examination are not less than those required by these regulations for the class of license for which he applies.

Sec. 53. Pilots' Examinations and Tests.

Unless exempt under these regulations, candidates must pass the following examinations and tests:

(A) TRANSPORT PILOTS.—(1) Examination on the air traffic rules and those portions of the Air Commerce Regulations pertaining to pilots' privileges and limitations and to the inspection and operation of aircraft.

(2) Practical and theoretical examination in elementary engine and plane mechanics and rigging and a theoretical examination in the fundamentals of meteorology and air navigation.

(3) Practical flight test, as follows:

(a) In addition to normal take-offs and land-

(*Continued on page 78*)



APPROVED TYPE CERTIFICATE GRANTED

BACH AIRCRAFT COMPANY

Santa Monica California

Say you saw it in AERO DIGEST

(Air Commerce Regulations continued)

ings, the following maneuvers will he required: From 1,500 feet, with engine throttled, make a 360 deg. turn and land in normal landing attitude, hy wheels touching ground in front of and within 200 feet of a line designated by examiner for the Department of Commerce.

(b) From 1,000 feet, with engine throttled, make a 180 deg. turn and land in normal landing attitude, by wheels touching ground in front of and within 200 feet of a line designated hy examiner for the Department of Commerce.

(c) A series of five gentle and three steep figure 8 turns from 800 to 1,000 feet, respectively. Spiral in one direction from 2,000 feet, with engine throttled, and land in normal landing attitude hy wheels touching ground in front of and within 200 feet of a line designated by examiner for the Department of Commerce.

(d) Fly in emergency maneuvers, doing spirals, side slips, climbing turns, and recovering from stalls.

(e) Fly over a triangular or rectangular course at least 100 miles, landing at place of take-off within at least five hours. This flight shall also include two ohligatory landings, not at point of departure, when craft must come to rest. The course will he designated and the candidate will he furnished with route information hy the examiner for the Department of Commerce at time of departure, and the examiner for the Department of Commerce will determine whether the course was correctly followed and whether ohligatory landings were satisfactory. Upon the presentation of satisfactory proof that the candidate has engaged in solo cross-country flights a distance of at least 100 miles within one year preceding the date of his application, the flight specified in this suhsection will be omitted.

(f) Cross-wind landings and take-offs.

(B) LIMITED COMMERCIAL PILOTS.—The same examinations and tests as are prescrihed for transport pilots, except the cross-country flight and the examination on elementary meteorology and navigation.

(C) INDUSTRIAL PILOTS.—(1) Examination on the air traffic rules and practical and theoretical examination in elementary engine and plane mechanics and rigging and those portions of the Air Commerce Regulations pertaining to pilots' privileges and limitations and to the inspection and operation of aircraft.

(2) The practical flight tests prescrihed for transport pilots, except the distance for the cross-country flight shall he 60 miles.

(D) PRIVATE PILOTS.—(1) Examination on the air traffic rules and those portions of the Air Commerce Regulations pertaining to pilots' privileges and limitations and to the inspection and operation of aircraft.

(2) The practical flight test specified in suhparagraph 3 *(c)* of section 53 *(A)* and three satisfactory landings to a full stop. A private pilot, classed as a student, will be licensed without heing required to pass the examination and tests prescrihed in this suhparagraph.

(E) REEXAMINATION.—Applicants for pilots' licenses who have failed to successfully accomplish the prescrihed theoretical or practical tests may apply for reexamination at any time after the expiration of 90 days from the date of such failure.

If the physical examination has expired for the class of license for which application has heen made, a new physical examination must he submitted.

The minimum passing grade for any suhject in the foregoing theoretical examinations shall he 70 per cent.

Practical tests must he accomplished to the satisfaction of the examiner for the Department of Commerce.

Sec. 54. Place, etc., of Examinations.

Examinations for pilots' licenses will he held at such times and places as the Secretary of Commerce shall designate. Such examinations and tests will he conducted hy an examining officer designated by the Secretary of Commerce. Candidates for pilots' licenses must furnish the airplanes in which the flight tests are to he made, unless the Secretary of Commerce makes other provisions therefor.

Sec. 55. Duration and Renewal of Pilots' Licenses.

(A) Unless sooncr revoked, transport and limited commercial pilots' licenses shall remain in force for six months and industrial and private pilots' licenses one year from date of issuance. Before any license is renewed, the Secretary of Commerce may, in his discretion, require the holder of such license to undergo any of the theoretical or practical tests prescrihed as requisites for the original license.

(B) Licenses will be renewed for like periods where the prescrihed physical condition of the holder is shown by the same method as when the original license was issued, except that a transport or limited commercial pilot must prove that he has had at least 10 hours of solo flying within the last 60 days, industrial pilots at least 25 hours within the last year, and private pilots at least 10 hours within the last year.

(C) If an applicant for renewal has not had the required solo flying and applies for a renewal within six months after the expiration of his last license, a new license will he issued to him upon proof of his physical qualifications and the passing of the flight tests required for the class of license he last held.

(D) Upon application to and permission of the Secretary of Commerce the area for permissible flying of aircraft carrying passengers, for hire, designated in the license of limited commercial pilots, will he changed to other areas.

(E) Upon application and for good cause shown the licenses specified in this chapter may he extended for 60 days.

Sec. 56. Personal Possession of Pilots' Licenses.

The pilot's license shall he kept in his personal possession when he is piloting aircraft and must be presented for inspection upon the demand of any passenger or any authorized official or employee of the Department of Commerce or State or municipal officials charged with enforcing local regulations or laws involving Federal compliance.

Sec. 57. Pilots' Flight Records.

A licensed pilot must keep an accurate record of his flying time in a log hook. It is the pilot's responsihility to ohtain and maintain this log hook.

Sec. 58. Carrying Passengers in Various Classes of Airplanes.

A licensed pilot, authorized to transport passengers, for hire, shall not do so in a type of aircraft which he has not previously operated within the last preceding 90 days for at least two hours, including 10 landings, 3 of which must have heen to a full stop.

Sec. 59. Seaplane Piloting.

A licensed pilot shall not carry passengers, for hire, in a seaplane unless he has piloted a seaplane for at least two hours within the last preceding 90 days, except where he makes practice flights in the seaplane for at least one-half hour and takes it off and lands it at least ten times. At least three of the landings must he to a full stop.

Sec. 60. Pilots' Night-Flying Qualifications.

A transport or limited commercial pilot who has not had at least two hours of night solo flying within the last preceding 90 days shall not pilot aircraft carrying passengers, for hire, between one-half hour after sunset and one-half hour before sunrise, except where he takes off and lands between one-half hour after sunset and one-half hour before sunrise, at least ten times solo. At least three of such landings must he to a full stop.

Sec. 61. Meaning of Solo Flying.

As used in these regulations, a person is engaged in solo flying when he is the sole operator of the controls and is in command of aircraft, in flight.

Sec. 62. Suspension or Revocation of Licenses.

Pilots' licenses will be suspended or revoked for—

(A) Violating any provision of the air commerce act of 1926 or these regulations.

(B) Carelessness or inattention to duty.

(C) Unsound physical condition or any demonstration of incompetency in the operation or repair of aircraft.

(D) Being under the influence, or using, or having personal possession of intoxicating liquor, cocaine, or other habit-forming drugs while on duty.

(E) Refusal to exhibit license upon proper demand.

(F) Violating air traffic rules.

(G) Making any false statement in application for license or in any reports required to be suhmitted hy these regulations.

(H) Carrying passengers who are obviously under the influence of intoxicating liquor, cocaine, or other habit-forming drugs.

(I) Piloting aircraft carrying passengers in excess of the original designed seating arrangements of the aircraft. Infants under 2 years of age are excepted, provided the maximum useful load is not exceeded.

(J) Doing any act in connection with aircraft which is contrary to the public safety or interest or detrimental to the morale of pilots or mechanics.

Chapter 6. LICENSING OF MECHANICS

Sec. 63. Mechanics, Law of.

*"The Secretary of Commerce shall by regulation * * * provide for the periodic examination and rating of airmen serving in connection with aircraft of the United States as to their qualifications for such service."* (*Sec.* 3 *(c).*)

"The term 'airman' means any individual (including the person in command and any pilot, mechanic, or member of the crew) who engages in the navigation of aircraft while under way, and any individual who is in charge of the inspection, overhauling, or repairing of aircraft." (*Sec.* 9 *(k).*)

*"It shall be unlawful * * * to serve as an airman in connection with any aircraft registered as an aircraft of the United States * * * without an airman certificate or in violation of the terms of any such certificate."* (*Sec.* 11 *(a)* (4).)

*"Any person who violates any provision of subdivision (a) of this section * * * shall be subject to a civil penalty of* $500." (*Sec.* 11 *(b).*)

Sec. 64. Application of the Law.

For the purpose of this chapter, persons repairing or adjusting licensed aircraft in flight and persons in charge of the ground inspection, overhauling, or repairing of licensed aircraft will he classed as mechanics. A workman or mechanic may engage in the repair or overhaul of licensed aircraft without heing licensed if such repair or overhaul is in charge of a licensed mechanic. An application for a mechanic's license must he filed, under oath, with the Secretary of Commerce upon hlanks furnished for that purpose. An applicant for a mechanic's license is not required to take a physical examination.

Sec. 65. Classification of Mechanics.

Mechanics are licensed as engine or airplane mechanics. A person may hold a plurality of licenses, such as both classes of mechanic's licenses or a pilot's and mechanic's license.

Sec. 66. Mechanics' Qualifications and Examinations.

(A) An applicant for an engine mechanic's license must have had at least two years' experience on internal-comhustion engines, one year of which must have been on aircraft engines. Such applicant will he licensed upon passing an examination on Air Commerce Regulations pertaining to the operation and inspection of aircraft and showing that he has sufficient knowledge of such engines and their accessories, including ignition systems, to properly inspect, maintain, repair and overhaul the same.

(B) An applicant for an airplane mechanic's license must have had at least one year's actual experience in servicing aircraft. Such an applicant will he licensed upon passing an examination on Air Commerce Regulations pertaining to the operation and inspection of aircraft, showing he is sufficiently qualified in plane structure and rigging, including control systems, to properly inspect, maintain, repair, and overhaul the same.

(C) The examinations for hoth classes of license will he hoth theoretical and practical. The minimum passing grade in each subject covered shall he 70 per cent. A citizen of any country may be licensed if found qualified. Examinations for mechanics' licenses will be held at such times and places as the Secretary of Commerce shall designate. Such examinations and tests will he conducted by an examining officer designated by the Secretary of Commerce.

(D) Applicants for mechanic's licenses who have failed to successfully accomplish the prescrihed theoretical or practical tests may apply for reexamination at any time after the expiration of 90 days from the date of such failure.

Sec. 67. Duration and Renewal.

Mechanics' licenses, unless sooner suspended or revoked, will remain in force for two years after date of issue and will he renewed for additional two-year periods upon proof that during the term of the last license the holder has rendered services under his license during at least one-half of the term thereof. Upon application and good cause shown the Secretary of Commerce may extend the license for a period of not more than 60 days. Before any license is renewed, the Secretary of Commerce may, in his discretion, require the holder of such license to undergo any of the theoretical or practical tests prescrihed as requisites for the original license.

Sec. 68. Personal Possession of Mechanics' Licenses.

A mechanic's license shall be kept in his personal possession when he is serving in connection with licensed aircraft and must he presented for inspection upon the demand of any passenger in or owner of repaired licensed aircraft upon which such mechanic has worked, or any authorized official or employee of the Department of Commerce or State or municipal officials charged with enforcing local regulations or laws involving Federal compliance.

Sec. 69. Suspension or Revocation of Licenses.

Mechanics' licenses will he suspended or revoked for—

(A) Violating any provision of the air commerce act of 1926 or these regulations.

(B) Carelessness or inattention to duty.

(C) Any demonstration of incompetency in the repair or overhaul of aircraft.

(D) Being under the influence, or using, or having personal possession of intoxicating liquor, cocaine, or other habit-forming drugs while on duty.

(E) Refusal to exhihit license upon proper demand.

(F) Making any false statement in application for license or in any reports required to he suhmitted hy these regulations.

(G) Doing any act in connection with aircraft which is contrary to the public safety or interest or detrimental to the morale of pilots or mechanics.

Chapter 7. AIR TRAFFIC RULES

Sec. 70. Law.

"The Secretary of Commerce shall by regulation establish air traffic rules for the navigation, protection, and identification of aircraft, including rules as to safe altitudes of flight and rules for the prevention of collisions between vessels and aircraft." (*Air commerce act of* 1926, *sec.* 3 *(e).*)

Sec. 71. Unlawful Acts.

*"It shall be unlawful * * * to navigate any aircraft otherwise than in conformity with the air traffic rules."* (*Sec.* 11 *(a)* (5).)

Sec. 72. Penalty.

*"Any person who violates any provision of subdivision (a) of this section * * * shall be subject to a civil penalty of* $500." (*Sec.* 11 *(b).*)

Sec. 73. Application of the Law.

"In order to protect and prevent undue burdens upon interstate and foreign air commerce the air traffic rules are to apply whether the aircraft is engaged in commerce or noncommercial, or in foreign, interstate, or intrastate navigation in the United States, and whether or not the aircraft is registered or is navigating in a civil airway." (Statement of managers accompanying conference report, air commerce act of 1926.)

Sec. 74. Flying Rules.

(A) RIGHT-SIDE TRAFFIC.—Aircraft flying in established civil airways, when it is safe and practicahle, shall keep to the right side of such airways.

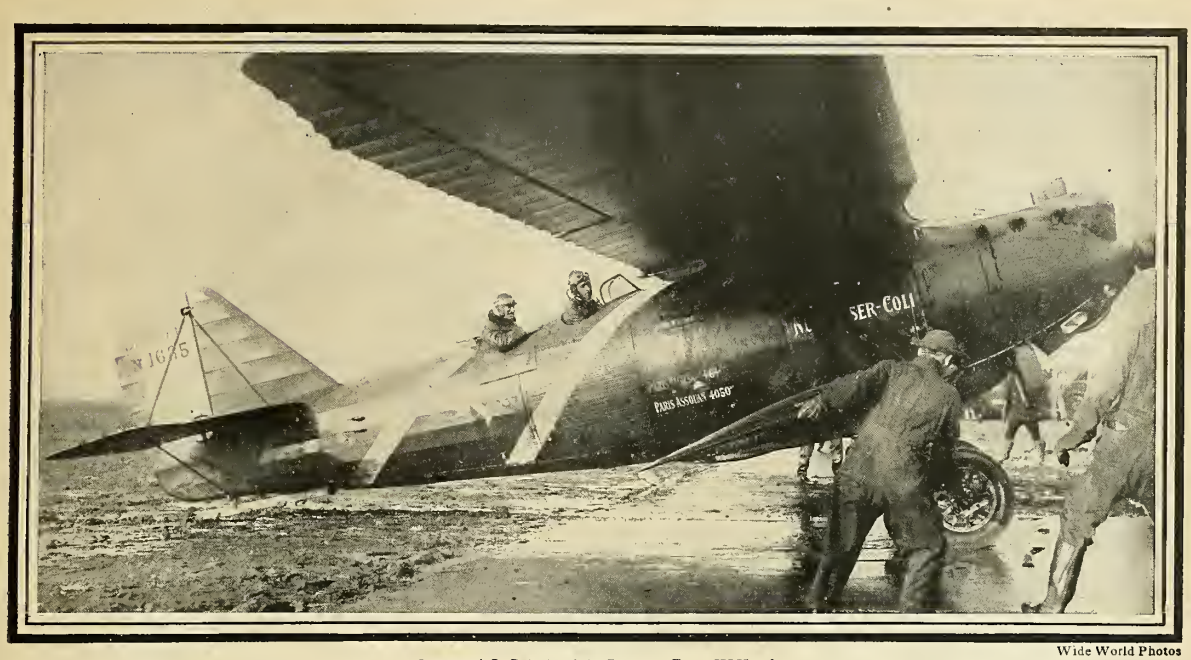
(B) GIVING-WAY ORDER.—Craft shall give way to each other in the following order:

(1) Airplanes.
(2) Airships.
(3) Balloons, fixed or free.

An airship not under control is classed as a free balloon. Aircraft required to give way shall keep a safe distance, having regard to the circumstances of the case. Three hundred feet will he considered a minimum safe distance.

(C) GIVING-WAY DUTIES.—If the circumstances permit, the craft which is required to give way shall avoid crossing ahead of the other. The other craft may maintain its course and speed, but no engine-driven craft may pursue its course if it would come within 300 feet of another craft, 300 feet heing the minimum distance within which aircraft, other than military aircraft of the United States engaged in military maneuvers and commercial aircraft engaged in local industrial operations, may come within proximity of each other in flight.

(Continued on page 80)



Wide World Photos

Costes and LeBrix in their Breguet, Type XIX, plane.

Even in the Far East they are using SOCONY

TOKYO to Hanoi, 2,500 miles, the longest non-stop flight in the Far East was made by Costes and LeBrix on their round-the-world trip. They made it on Socony Aviation Gasoline.

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STANDARD OIL COMPANY OF NEW YORK

(Air Commerce Regulations continued)

(D) CROSSING.—When two engine-driven aircraft are on crossing courses the aircraft which has the other on its right side shall keep out of the way.

(E) APPROACHING.—When two engine-driven aircraft are approaching head-on, or approximately so, and there is risk of collision, each shall alter its course to the right, so that each may pass on the left side of the other. This rules does not apply to cases where aircraft will, if each keeps on its respective course, pass more than 300 feet from each other.

(F) OVERTAKING.—(1) *Definition.*—An overtaking aircraft is one approaching another directly from behind or within 70 deg. of that position, and no subsequent alteration of the bearing between the two shall make the overtaking aircraft a crossing aircraft within the meaning of these rules or relieve it of the duty of keeping clear of the overtaken craft until it is finally past and clear.

(2) *Presumption.*—In case of doubt as to whether it is forward or abaft such position it should assume that it is an overtaking aircraft and keep out of the way.

(3) *Altering course.*—The overtaking aircraft shall keep out of the way of the overtaken aircraft by altering its own course to the right, and not in the vertical plane.

(G) HEIGHT OVER CONGESTED AND OTHER AREAS.—Exclusive of taking off from or landing on an established landing field, airport, or on property designated for that purpose by the owner, and except as otherwise permitted by section 79, aircraft shall not be flown—

(1) Over the congested parts of cities, towns, or settlements, except at a height sufficient to permit of a reasonably safe emergency landing, which in no case shall be less than 1,000 feet.

(2) Elsewhere at height less than 500 feet, except where indispensable to an industrial flying operation.

(H) HEIGHT OVER ASSEMBLY OF PERSONS.—No flight under 1,000 feet in height shall be made over any open-air assembly of persons except with the consent of the Secretary of Commerce. Such consent will be granted only for limited operations.

(I) ACROBATIC FLYING.—(1) Acrobatic flying means intentional maneuvers not necessary to air navigation.

(2) No person shall acrobatically fly an aircraft—

(a) Over a congested area of any city, town, or settlement.

(b) Over any open-air assembly of persons or below 2,000 feet in height over any established civil airway, or at any height over any established airport or landing field, or within 1,000 feet horizontally thereof.

(c) Any acrobatic maneuvers performed over any other place shall be concluded at a height greater than 1,500 feet.

(d) No person shall acrobatically fly any airplane carrying passengers for hire.

(e) Dropping objects or things.—When an aircraft is in flight the pilot shall not drop or release, or permit any person to drop or release, any object or thing which may endanger life or injure property, except when necessary to the personal safety of the pilot, passengers, or crew.

(J) SEAPLANES ON WATER.—Seaplanes on the water shall maneuver according to the laws and regulations of the United States governing the navigation of water craft, except as otherwise provided herein.

(K) TRANSPORTING EXPLOSIVES.—The transporting of any explosives other than that necessary for signaling or fuel for such aircraft while in flight or materials for industrial and agricultural spraying (dusting) is prohibited, except upon special authority obtained from the Secretary of Commerce.

Sec. 75. Take-off and Landing Rules.

(A) METHOD.—Take-offs and landings shall be made upwind when practicable. The take-off shall not be commenced until there is no risk of collision with landing aircraft and until preceding aircraft are clear of the field. Aircraft when taking off or landing shall observe the traffic lanes indicated by the field rules or signals. No take-off or landing shall be made from or on a public street or highway without the consent of the local governing authority and the approval of the Secretary of Commerce.

(B) COURSE.—If practicable, when within 1,000 feet horizontally of the leeward side of the landing field the airplane shall maintain a direct course toward the landing zone.

(C) RIGHT OVER GROUND PLANES.—A landing plane has the right of way over planes moving on the ground or taking off.

(D) GIVING WAY.—When landing and maneuvering in preparation to land, the airplane at the greater height shall be responsible for avoiding the airplane at the lower height and shall, as regards landing, observe the rules governing overtaking aircraft.

(E) DISTRESS LANDINGS.—An aircraft in distress shall be given free way in attempting to land.

Sec. 76. Lights.

(A) ANGULAR LIMITS.—The angular limits laid down in these rules will be determined as when the aircraft is in normal flying position.

(B) AIRPLANE LIGHTS.—Between one-half hour after sunset and one-half hour before sunrise airplanes in flight must show the following lights:

(1) On the right side a green light and on the left side a red light, each showing unbroken light between two vertical planes whose dihedral angle is 110 deg. when measured to the left and right, respectively, from dead ahead. These lights shall be visible at least 2 miles.

(2) At the rear and as far aft as possible a white light shining rearward, visible in a dihedral angle of 140 deg. bisected by a vertical plane through the line of flight and visible at least 3 miles.

(C) AIRSHIP LIGHTS.—Between one-half hour after sunset and one-half hour before sunrise airships shall carry and display the same lights that are prescribed for airplanes, excepting the side lights shall be doubled horizontally in a fore-and-aft position, and the rear light shall be doubled vertically. Lights in a pair shall be at least 7 feet apart.

(D) BALLOON LIGHTS.—A free balloon, between one-half hour after sunset and one-half hour before sunrise, shall display one white light not less than 20 feet below the car, visible for at least 2 miles. A fixed balloon, or airship, shall carry three lights—red, white, and red—in a vertical line, one over the other, visible at least 2 miles. The top red light shall be not less than 20 feet below the car, and the lights shall be not less than 7 nor more than 10 feet apart.

(E) LIGHTS WHEN STATIONARY.—(1) Between one-half hour after sunset and one-half hour before sunrise all aircraft which are on the surface of water and not under control, or which are moored or anchored in navigation lanes, shall show a white light visible for at least 2 miles in all directions.

(2) Balloon and airship mooring cables between one-half hour after sunset and one-half hour before sunrise shall show groups of 3 red lights at intervals of at least every 100 feet, measured from the basket, the first light in the first group to be approximately 20 feet from the lower red balloon light. The object to which the balloon is moored on the ground shall have a similar group of lights to mark its position.

Sec. 77. Day Marks of Masts, etc.

By day, balloon and airship mooring cables shall be marked with tubular streamers not less than 8 inches in diameter and 7 feet long and marked with alternate bands of white and red, 20 inches in width. The object to which the balloon or airship is moored on the ground shall have the same kind of streamers, which must be in the same position as the lights specified herein.

Sec. 78. Signals.

(A) DISTRESS.—The following signals, separately or together, shall, where practicable, be used in case of distress:

(1) The international signal, S O S, by radio.

(2) The international-code flag signal of distress, NC.

(3) A square flag having either above or below it a ball, or anything resembling a ball.

(B) SIGNAL WHEN COMPELLED TO LAND.—When an aircraft is forced to land at night at a lighted airport it shall signal its forced landing by making a series of short flashes with its navigation lights if practicable to do so.

(C) FOG SIGNALS.—In fog, mist, or heavy weather an aircraft on the water in navigation lanes, when its engines are not running, shall signal its presence by a sound device emitting a signal for about five seconds in two-minute intervals.

Sec. 79. Deviation from Air Traffic Rules.

The air traffic rules may be deviated from when special circumstances render a departure necessary to avoid immediate danger or when such departure is required because of stress of weather conditions or other unavoidable cause.

Chapter 8. MISCELLANEOUS

Sec. 80. Civil Penalties.

"Any person who (1) *violates any provision of subdivision (a) of this section or any entry or clearance regulation made under section 7, or* (2) *any customs or public health regulation made under such section, or* (3) *any immigration regulation made under such section, shall be subject to a civil penalty of* $500, *which may be remitted or mitigated by the Secretary of Commerce, the Secretary of the Treasury, or the Secretary of Labor, respectively, in accordance with such proceedings as the Secretary shall by regulation prescribe * * * ."* (*Air commerce act of* 1926, *sec.* 11 (*b*).)

Sec. 81. Penalty Proceedings.

The Secretary of Commerce, or his duly authorized representative, will notify all persons of the incursion of penalties subject to mitigation or remission by the Secretary, and any person charged with a civil penalty may transmit to the Secretary of Commerce, within the time prescribed in the notification of such penalty, an affidavit stating the facts upon which the request for mitigation or remission is based. The Secretary of Commerce will then determine whether or not the penalty will be mitigated or remitted, and the person making the request will be notified accordingly.

Sec. 82. Waiver of Regulations.

The Secretary of Commerce may waive any of the requirements of these regulations when, in his discretion, the particular facts justify such waiver.

Sec. 83. Savings Clause.

An aircraft required to be licensed under the air commerce act of 1926 may operate under a letter of authority from the Secretary of Commerce or his duly authorized representative pending the official inspection of such aircraft, provided an application for aircraft license is on file with the Secretary of Commerce and all the provisions of these regulations have been complied with.

In so far as these regulations amend the existing regulations they shall become effective on June 1, 1928, except as to sections 10 and 11, which shall become effective on August 1, 1928.

MEDICAL EXAMINERS for PILOT'S LICENSE

THE following additions have been made to the list of Medical Examiners authorized by the Department of Commerce to make the physical test of airplane pilots, which was published in the December 1927 issue of AERO DIGEST.

Arkansas

Dr. Andre B. Carney and Dr. J. McDaniel, Jr., Ft. Smith.

California

Dr. Werner F. Hoyt, Berkeley; Dr. Francis M. Shook, Oakland; Dr. W. C. Zeller and Dr. C. M. White, Visalia.

Colorado

Dr. H. W. Woodward, Colorado Springs.

Florida

Dr. S. B. Forbes, Tampa; Dr. S. W. Fleming and Dr. W. Y. Sayad, West Palm Beach.

Georgia

U. S. Marine Hospital No. 20, Savannah.

Hawaii

Dr. C. E. Fronk, Dr. W. H. Wynn, Honolulu.

Indiana

Dr. Karl T. Brown, Muncie; Dr. D. D. Johnston, Ft. Wayne.

Iowa

Dr. George A. Hartley and Dr. G. S. Millico, Battle Creek; Dr. Geo. E. Hearst, Cedar Falls; Dr. B. S. Barnes and Dr. J. O. Weaver, Shenandoah.

Kentucky

Dr. C. W. Trapp, Lexington; Dr. Gaylord C. Hall, Louisville.

Massachusetts

Dr. Eugene C. Boss, Dr. Harry F. Byrnes and Dr. Harold C. Goodwin, Springfield.

Michigan

Dr. Edgar E. Poos and Henry Ford Hospital, Detroit.

Minnesota

Dr. F. W. Briggs and Dr. D. D. Murray, Duluth.

Mississippi

Dr. J. F. Armstrong and Dr. Victor W. Maxwell, Jackson.

Montana

Dr. William R. Morrison and Dr. W. G. Richards, Billings; Dr. J. A. Everet and Dr. A. L. Hammerel, Glendive; Dr. Ivan A. Allred, Great Falls.

Nebraska

Dr. Ralph G. Grossman and Dr. E. C. Foote, Hastings; Dr. J. Stanley Hill and Dr. Roland R. Reed, McCook; Dr. T. J. Kerr, Dr. H. H. Walker, North Platte.

New Jersey

Dr. Louis R. Burnett, Paterson.

New York

Dr. A. Wallace Todd, Albany; Dr. Albert W. Greene, Dr. E. MacD. Stanton and Dr. C. W. Woodall, Schenectady; Dr. Glendon R. Lewis, Syracuse; Dr. Lloyd E. Tefft, Wellsville; Dr. Walter S. Atkinson and Dr. Walter F. Smith, Watertown.

Pennsylvania

Dr. Ben C. Gile, Philadelphia; Dr. Solon L. Rhode and Dr. W. W. Becker, Reading.

South Carolina

Dr. Hugh P. Smith and Dr. J. W. Jervey, Greenville; Dr. F. H. Sanders and Dr. L. Rosa H. Gantt, Spartanburg.

South Dakota

Dr. N. T. Owen and Dr. J. M. Walsh, Rapid City.

Tennessee

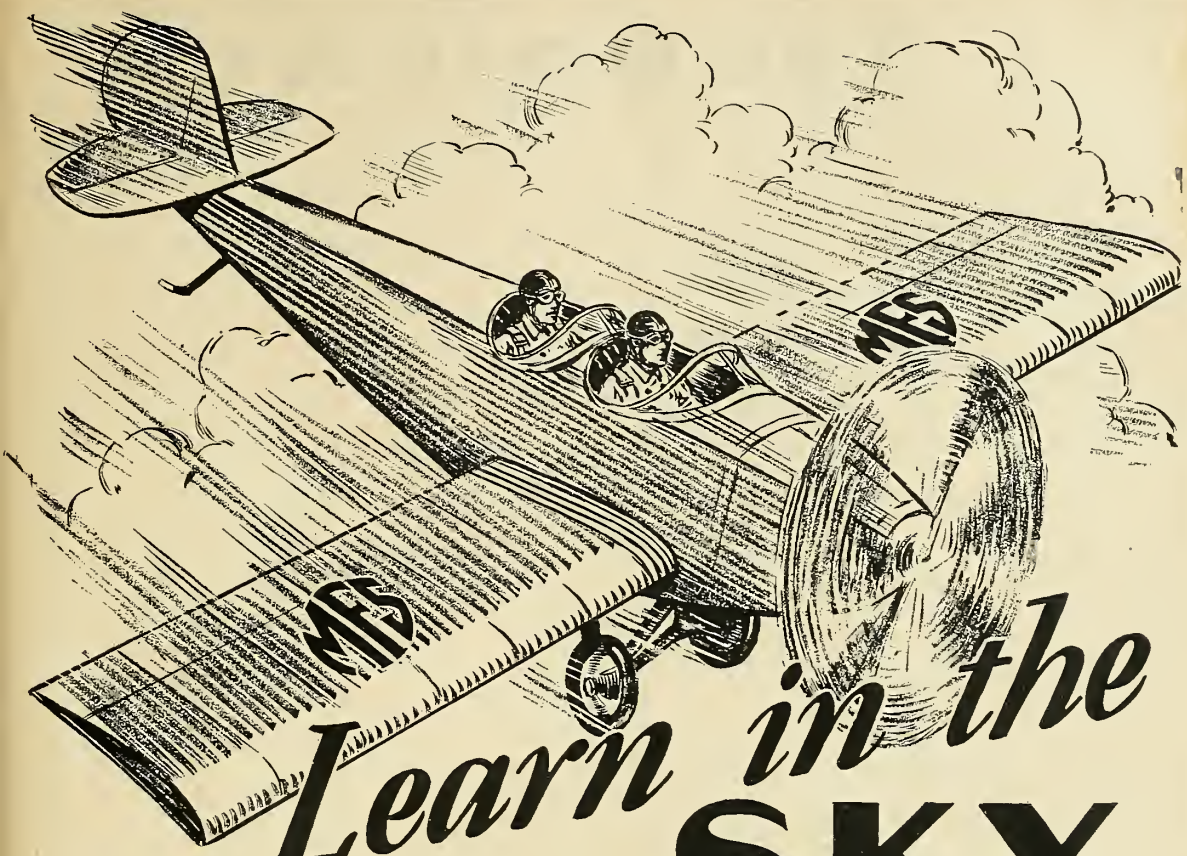
Dr. T. Lyles Davis and Dr. A. F. Ebert, Chattanooga.

West Virginia

Dr. T. W. Moore and Dr. W. C. Swann, Huntington.

Wisconsin

Dr. William H. Schnell and Dr. Frank C. Sarazin, Superior; Dr. J. M. Freeman and Dr. H. T. Schlegel, Wausau.



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TECHNICAL

THE HAMILTON METALPLANE

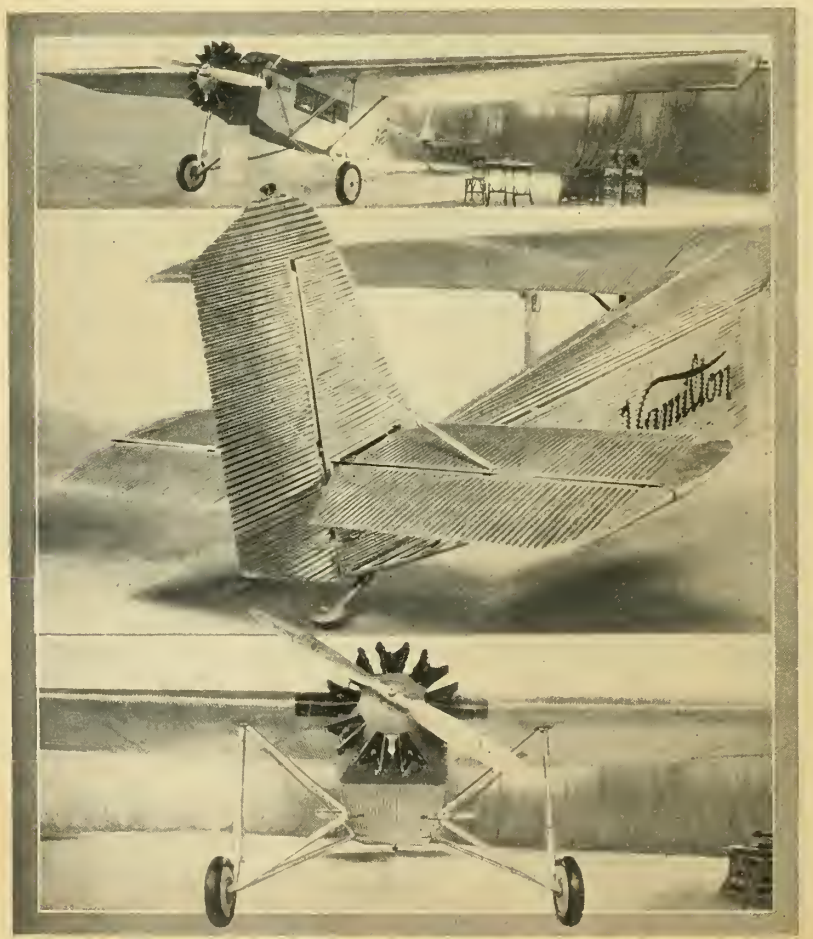
THE Hamilton Metalplane is a cabin monoplane, capable of comfortably seating six passengers in addition to the pilot and navigator. It is constructed entirely of Alclad, non-corrosive duralumin. From the standpoint of cost of operation and safety, the advantages of all-metal construction are many. Greater strength and rigidity reduce the necessity of constant adjustments and replacements. The Hamilton Metalplane is permanently aligned. Because the materials are uniform throughout and can be accurately tested, known safety margins can be allowed.

Duralumin construction offers two additional factors which are of the greatest importance. The first is the fire-resisting properties of the metal. The second is that it is weather-proof, assuring comfort to the passengers and adding greatly to the useful life of the plane.

The design of the plane is unusually clean. The wings are tapered in both thickness and chord. The propeller is fitted with a spinner and from the tip of this spinner to the tail of the fuselage is a practically unbroken, smooth surface. All controls are carried within the fuselage or wings. The stabilizer is adjustable in flight.

The position of the wing on the Hamilton Metalplane high up on top of the fuselage is another advantage. It is practically impossible to damage it by coming in contact with the ground on rough fields, or when turning in strong cross winds.

Control surfaces are operated by push and pull rods adjusted individually to the ship. The landing gear is of the split axle type and is constructed to withstand hard service without need of adjustment. Bendix brakes, operating individually on either wheel are standard equipment and greatly assist during the warming up period, or in taxiing across landing fields. Wings are wired for lighting.



The Pratt & Whitney "Wasp" engined Hamilton all-metal monoplane.

Its climb is rapid and if driven to a stalling position, will right itself. Due to its inherent stability it may be flown "hands off".

In appointments, comfort and luxury, the plane compares favorably with the modern enclosed motor car. The commodious cabin is beautifully finished and may be entered from either side. Insulation makes the cabin quiet and comfortable. The cockpit is accessible from the cabin.

Cabin windows are trimmed with inlaid walnut. Fittings include window lowering levers, dome lights, vanity case and cigar lighter. Upholstering is fire-proof mohair.

Hamilton Metalplanes are equipped with Hamilton metal propellers, tachometer, altimeter, air speed indicator, compass, fuel gauge, clock, oil pressure indicator, and oil temperature gauge. The land planes have oleo and air shock absorbers and the seaplanes have all metal floats.

The accompanying illustrations show the Hamilton "Silver Streak" Metalplane exhibited at the Aircraft Show in Detroit this spring where it was shown to the general public for the first time and attracted much favorable attention.

Landplane Specifications

	("Silver Eagle")	*("Silver Streak")*
Model designation	H-19	H-21
Number of seats	Four to eight	Six to eight
Make of engine	Wright Whirlwind	Pratt and Whitney Wasp
Wing span	48 feet	54 feet
Wing area (square feet)	287	392
Length overall	32 feet 7 inches	33 feet 7 inches
Height overall	8 feet 10 inches	9 feet
Weight empty (pounds)	1960	2495
Useful load (pounds)	2000	2205
Gross weight (loaded)	3960 pounds	4700
High speed (m.p.h.)	120	138
Cruising speed (m.p.h.)	100	115
Landing speed (m.p.h.)	50	58
Climb at sea level (1st minute)	750 feet	1000 feet
Fuel capacity (gallons)	100	140
Normal range (miles)	650	750
Normal fuel consumption per hour at cruising speed	12 gallons	21 gallons

Seaplane Specifications

	("Silver Swan")	*("Silver Sea-dan")*
Model designation	H-20	H-23
Number of seats	Four to six	Six to eight
Make of engine	Wright Whirlwind	Pratt and Whitney Wasp
Wing span	52 feet	54 feet
Wing area (square feet)	320	392
Length overall	35 feet 7 inches	37 feet 7 inches
Height overall	10 feet	10 feet 6 inches
Weight empty (pounds)	2290	2870
Useful load (pounds)	1600	2000
Gross weight, loaded (pounds)	3890	4870
High speed	105	120
Cruising speed	90	103
Landing speed	50	58
Climb at sea level (1st minute)	650 feet	850 feet
Fuel capacity (gallons)	100	140
Normal range (miles)	570	700
Normal fuel consumption per hour at cruising speed	12 gallons	21 gallons

PLAIN TALKS ON FINE BEARINGS

No. 1—

There may be cases, in some industries, where the best bearing obtainable is better than the service actually calls for. Then its purchase may be an extravagance—a slight price saving may be justified.

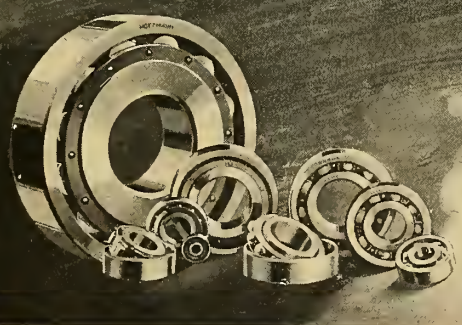
But in aircraft industries, the hazards resultant upon a bearing failure are too great to justify any price compromise. With the lives of pilot and passengers at stake (to say nothing of the plane itself)—indeed, with the future of aviation and of national defense in the balance—the use of the best bearings, regardless of price, is dictated by every consideration.

As for **Norma-Hoffmann** Precision Bearings—"the difference in service is so much greater than the difference in price."

Lindbergh—
Byrd—
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The Belgian Aero Club's Memorial to the Air Heroes of the World War.



NORMA-HOFFMANN BEARINGS CORPORATION
Stamford—Connecticut
PRECISION BALL, ROLLER AND THRUST BEARINGS

N-58

WRIGHT "CYCLONE" ENGINE

BY GUY W. VAUGHAN

THE Wright Cyclone air-cooled aircraft engine is rated at 550 horsepower at 2,000 r.p.m. and is the largest American radial in production. In design it incorporates the experience of an organization devoted exclusively to the output of air-cooled engines and one which, with the earnest support of the U. S. Navy has sponsored the development of this type of engine. Much credit for this design is due to the Bureau of Aeronautics which has pioneered the development of American air-cooled engines.

The Cyclone is a static radial type with nine cylinders of six inch bore and six and seven-eighths inch stroke, giving a piston displacement of 1,750 cubic inches. The compression ratio is 5.1 to 1 and the engine operates satisfactorily on domestic aviation gasoline.

Cylinder construction is of the composite type. A forged steel barrel with cooling fins machined integrally is screwed into an aluminum head expanded by heat to give a shrink fit. Twelve studs passing through the hold-down flange secure the cylinder barrel which bottoms deeply within the crankcase. Inlet and exhaust valve axes are inclined at an angle of 35° from the vertical center line of the dome-shaped combustion chamber. The exhaust port is amply finned and both inlet and exhaust ports are provided with inserted bronze flanges. Valve guides are made of tungsten steel shrunk in the cylinder head. Two spark plug ports diametrically opposite face fore and aft. Valve seats of aluminum bronze are shrunk in the head and machined with a seat on a 45° angle.

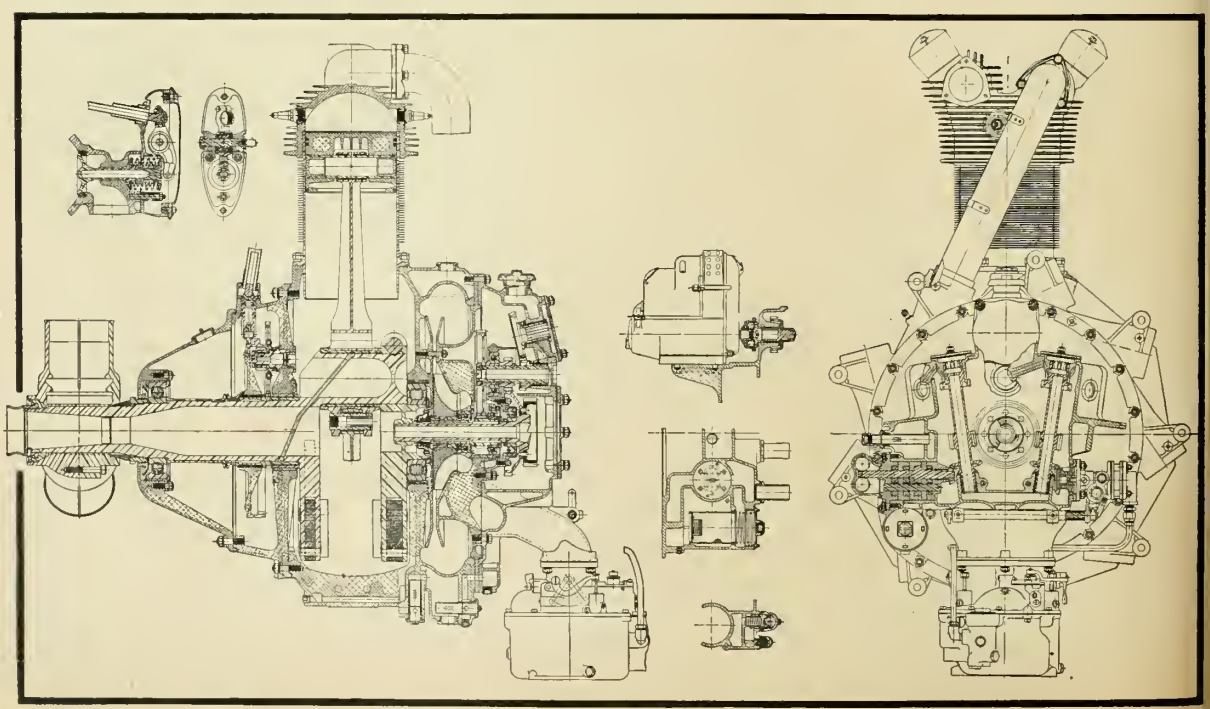
The valves are two in number of the tulip type. The inlet valve is of tungsten steel while the exhaust is made both in tungsten and cobalt chrome with a hollow salt-filled stem for cooling. Three music wire helical springs hold each valve to its seat. The valves are actuated by means of a pushrod and rocker arm. The valve gearing is entirely enclosed in rocker boxes attached to the cylinder head. A case-hardened four lobe drum cam with two parallel sets of cams for inlet and exhaust valve operation is located in the nose of the engine. The cam runs at one-eighth crankshaft speed in the opposite direction and operates the valves with the following timing: inlet opens 25° early and closes 60° late; exhaust opens 80° early and closes 25° late.

Cam followers are of the roller type carried in hardened steel guides secured by studs in the front section of the crankcase. The crankcase is a heat-treated aluminum alloy casting light in weight and yet strong due to the method of webbing. The rear wall houses a roller bearing supporting the rear of the crankshaft while to the front is bolted the section containing the cam gearing, tappets and plain bearing for the front of the crankshaft.

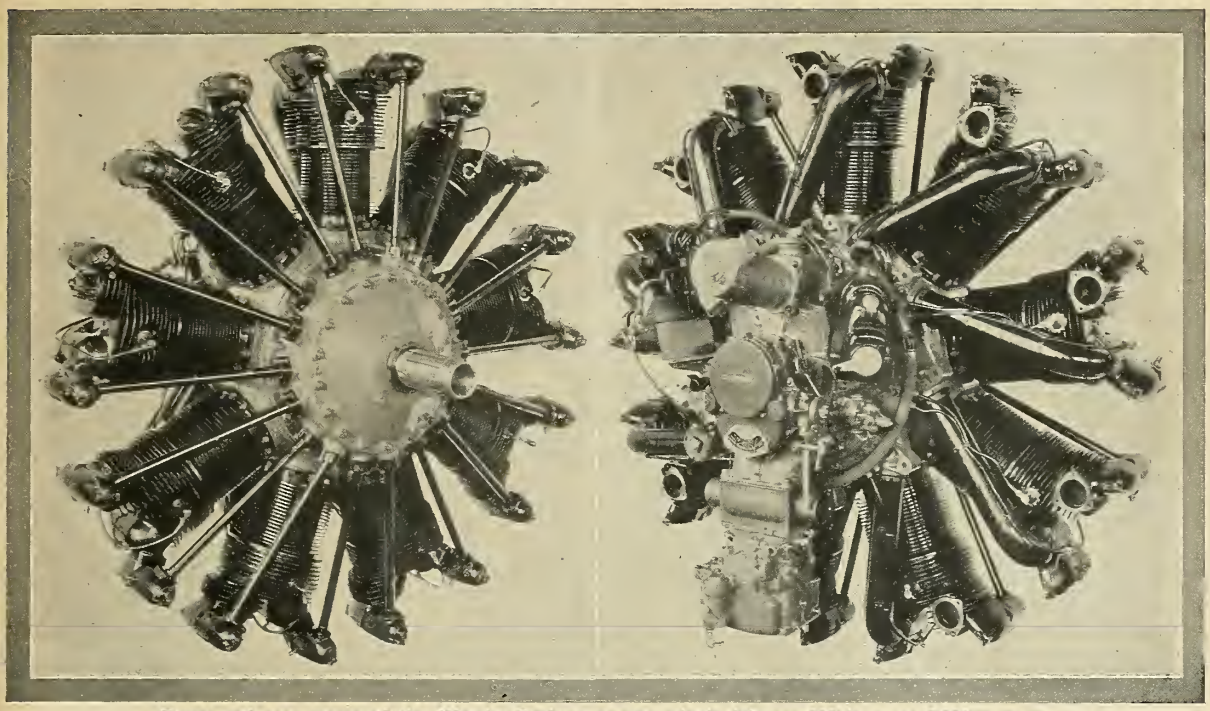
All auxiliaries are grouped on the rear section within the mounting circle. These include magnetos, oil pump, fuel pump, starter and generator. The necessary gearing for driving these units as well as the supercharger and gun synchronizers is all contained within the rear section.

Uniform distribution of the fuel mixture to each cylinder is accomplished by means of a rotary induction system. A centrifugal type blower is built into the rear section of the engine and takes its suction through a Stromberg NA-Y7A carburetor. A forged duralumin impeller especially designed for this engine by the General Electric Company and geared at eight times crankshaft speed forces the fuel mixture through the induction pipes. Within the rear section the induction passages are jacketed with hot oil to reduce ice formation and improve distribution as well as cool the lubricating oil.

The lubrication system is the conventional dry sump type with oil forced under a pressure of 75-100 lbs. per sq. in. to the principal bearing surfaces. The oil pump is a quadruple gear type comprising three scavenging units and one pressure pump all operating at three-quarters crankshaft speed. The suction line of the pressure unit is connected to the bottom of a main supply tank external to the engine. Oil is forced through a screen into drilled passages in the crankcase thence to the front main bearing. A steel supply tube within the hollow crankshaft registers with an annular groove in the bearing and conveys the oil to the crankpin journal. Oil passes from an annular groove in the master rod bearing into holes drilled through the cheeks of the rod to each hollow knuckle pin. The spray of oil thrown



Sectional drawings showing construction and a few of the assembly details of the Wright Cyclone engine.



Front and rear views of the Wright Cyclone engine which delivers 550 h. p. at 2,000 r. p. m.

from the crankpin and knuckle pins lubricates the cylinder walls and piston pins. The two vertical drive shafts in the rear section receive oil under pressure and the excess lubricant is splashed on magneto drive gears, fuel and oil pump drive gears, and on the supercharger drive gears. In the front of the engine the oil is conveyed under pressure to the cam drive gear bushing. The cam, valve tappets and rollers receive their lubrication by oil escaping from this source. Surplus oil drains to the bottom of the front section, the main crankcase, and the rear section whence it is removed by the three scavenging units and delivered to the main supply tank.

The crankshaft is a nickel steel forging of the two-piece type. The sections are large to insure unusual rigidity and yet the shaft is light owing to its hollow construction. A large clamp bolt on the rear split cheek locks the shaft into one solid unit. The shaft is carried on three bearings. A ball thrust is located in the nose of the engine to absorb the propeller thrust. The front main bearing is of the plain type while the rear of the crankshaft is carried on a heavy duty roller bearing.

The I-section master rod is a one-piece nickel steel drop forging machined all over. A steel-backed babbitt-lined bearing is pressed and pinned into the large end while the small end is bushed with bronze to carry the piston pin. Eight knuckle pins are supported in the master rod cheeks to hold the link rod assembly. These link rods are also of I-section and made of nickel steel. Piston pins float both in the rod and piston with a duralumin plug in each end to prevent scoring of the cylinder. Pistons are the trunk type, internally ribbed, and with two ring grooves above the pin and one below.

Ignition is furnished by two Scintilla AG-9D magnetos mounted at the rear of the engine. Magnetos turn at one and one-eighth crankshaft speed and each fires one spark plug in each cylinder. The spark advance is set at 30° before top dead center for both magnetos.

The first Cyclone engine was assembled on September 7, 1926. After a short period of developmental testing the engine was started on a standard fifty hour endurance test run in accordance with the Navy specifications. This was successfully concluded on January 7, 1927. The test was run on straight domestic aviation gasoline with an average specific fuel consumption of .55 lbs. per B.H.P. per hour, and oil consumption of .022 lbs. per B.H.P. per hour. There were no major failures and the engine showed very little wear upon examination after the test. Further developmental work was continued on this engine to obtain proper valve clearances, timing, and carburetion. Several changes in design were brought through, an exhaust collector ring was built and tested and then the Cyclone engine was placed on a second fifty hour endurance test. This was run and successfully completed in the month of July, 1927. Again the fuel used was straight domestic aviation gasoline and the specific fuel consumption averaged .55 lbs. per B.H.P. per hour. Despite the fact that this test was conducted during the heat of the summer no cooling difficulties were experienced and the run was completed without any failures. Further testing was conducted in the XO-3 test plane owned by the Wright Aeronautical Corporation. The majority of these flight tests have been carried out at full throttle. Carburetor settings, tests on exhaust manifolds, air heaters and hotspots and straight endurance running have now taken over two hundred hours in the air on the Cyclone engine.

The first production Cyclone engine has passed the fifty hour Navy endurance test and has now had twenty-five hours in the air in the XO-3 test plane. A production schedule of twenty engines a month will be increased as soon as the new buildings of the Wright Aeronautical Corporation are available.

Two of these engines were used in the record breaking Navy PN-12 flying boat.

USEFUL NEW BOOKLET ISSUED ON ROEBLING AIRCRAFT PRODUCTS

A BOOKLET of 15 pages has been issued by John A. Roebling's Sons Co., of Trenton, New Jersey, in which technical information is given on several of their wire products widely used in the aircraft field. Specifications are given for standard tinned aircraft wire, galvanized aircraft strand, cotton center galvanized aircraft cord, wire center galvanized aircraft cord, and tinned aircraft cord. Information is given on the gauge, diameter in inches, weight per 100 feet, bend and tortion tests, breaking strength and tensile strength of the various wires listed. Charts of dimensions are given for galvanized steel aircraft thimbles, and standard steel aircraft ferrules.

Technical information is also given for ignition cables of various kinds.

Other products made by the John A. Roebling Company for the aircraft industry include wire rope, slings, fittings; welding wire (gas and electric); serving and locking wires; balloon cables; electrical wires and cables; control strand, cord and casing; steel brass and copper wire.

OLEO GEARS FOR AIRCRAFT

By EDWIN E. ALDRIN
1st Lieut. U. S. A., Air Corps,
Materiel Division

Presented at a meeting of the American Society of Mechanical Engineers

AIRPLANES in landing are subject to shock which has in the past been taken up by tires, coils of rubber, shock-absorber cord, or rubber disks in compression, and bouncing of the machine. Another form of gear is that using an oil damping device. In the recoil mechanism of guns there has long been employed an oil system to take the firing shock, consisting of cylinder and piston, the latter with a few slots in the circumference for the oil to pass through but with tapering throttling bars varying the orifice. The British have pioneered this application of "oleo" to aircraft under-carriage shock-absorption for upwards of a decade.

Initial efforts in this country centered on the non-return oleo gear for the Barling bomber designed in 1921. Before this, the oleo mechanism was oleo-pneumatic, that is, used in conjunction with compressed air. Springs or other mechanical means for returning the gear to the extended position after the initial shock were sometimes used. In such mechanisms, the shock was partly taken by the oil cylinder and partly by the spring air, or other return medium, and they suffered the disadvantage of causing bouncing because of insufficient hysteresis or dissipation of energy. These mechanisms were, nevertheless, usually better than the rubber-cord suspensions.

Laddon developed a compressed-air-spring device which was tested at McCook Field shortly after the Barling design, but owing to lack of funds, no application of this device was made on a divided-axle type of landing gear. Now, however, the divided-axle type landing gears have almost entirely superseded the straight-axle type. The former can clear obstructions which might block the latter, and in landing in tall grass, the resistance of the former is so much smaller that the chances of "nosing-over" are considerably reduced. The weight and air resistance are about the same for both types, although the divided-axle type is much lighter when used in multi-engine machines. The change from straight axle to divided axle has therefore been the occasion for the widespread use of oleo gears in this country in nearly all except the lightest machines.

The final design of the oleo mechanism combination depends on the type of landing gear used. It may not be amiss to mention the several types. The split-axle steel-tube chassis really only raises the center of the axle up to an elevated position at a braced hinge joint. The crossed-axle type consists essentially of unit tripods for each wheel and may be composed of various linkages to reduce local stresses, as in the Curtiss "Hawk", or may comprise a single-piece, semi-floating axle bent up and pinned to a fuselage member or wing spar. Other unit-type landing gears are similar, but with wheels further apart so that the bent axles do not cross.

It can be fairly stated that after the theoretical consideration given by G. H. Dowty in England, the experiments conducted at the United States Army station, McCook Field, have largely furnished the basis on which American manufacturers have calculated their oleo gears. After a detailed study of all gears up to 1925, especially the Vickers, various modifications were drop-tested. Further tests on the effect of viscosities and different orifices were made in 1927 at the Massachusetts Institute of Technology. Many special combinations in adaptation of this and other data have been successfully developed, tested, and installed by a large number of individual manufacturers. An attempt is made here to present the information which has thus been made available as a basis of discussion and in the hope of provoking further tests or the announcement of such tests as have been made but not published.

As previously stated oleo gears may be classified as "return" and "non-return."

The oleo-pneumatic gear consists of a piston and a partially filled cylinder of oil, with air under pressure to hold the gear extended under normal load. The diameter of the cylinder is determined by the load carried by the oleo leg, which is the product of the unit initial air pressure and the area of the piston. To preserve a reasonable cylinder dimension, an extremely high air pressure is required, typical values being 500-700 lb. per sq. in. This requires the use of a most efficient packing gland and special hand air-pump equipment which gives considerable trouble. Air leaks have caused severe ground-loops in landing due to unequal shock absorption. While this type of gear operates satisfactorily, the maintenance thereof, initial cost, and complication are considerable and it is rapidly losing favor in comparison with the simpler and more foolproof mechanisms.

Type	Medium used for shock in— Taxiing	Landing	Return*	Examples
1-Oleo-pneumatic	air	oil and air	air	Vickers, T. M. O-6
2-Oleo-rubber	rubber	rubber and oil	rubber	Army, Curtiss, Douglas, etc.
3-Oleo-spring	spring	oil and spring	spring	Keystone, LB-5, Boeing
4-Oleo	pad and tire	oil	"Non-return" —gravity	Barling, XO-2, Douglas

*Rebound is checked by the oil on all, that being a secondary object of the gear, the primary object being a maximum amount of energy dissipation in the down stroke.

Referring to the sectional view of this type in Fig. 1, the principal parts are as follows: a steel cylinder 1, containing an aluminum plunger or metering pin 3, which is fixed at the top of the cylinder; a movable tubular piston 2, located at the bottom of the cylinder, and sealed in the cylinder by the packing and packing rings 6, 7, and 8, and the large nut 4. The upper end of the movable piston carries a slotted bronze ring which, together with a movably mounted ring on the under side of the slotted ring, forms the rebound check 9. In the side of the cylinder is mounted the filling valve 10 and above it the test valve 11. The packing nut 4 is locked in place by the safety 5, which is secured by the locking screw 14 of the test valve. This arrangement prevents the removal of the piston while there is any pressure in the cylinder.

The operation of this absorber is as follows: when the airplane lands, the load imposed upon the piston forces it upward. The upward motion of the piston is retarded by:

(a) The compression of the air in the upper part of the cylinder; this air is initially forced into the cylinder at a pressure of several hundred pounds per square inch.

(b) The throttling of the passage of the oil from the cup in the piston into the cylinder, which is accomplished by the tapered metering pin 3.

(c) The flow of oil through the slots in the bronze piston valve ring 9.

The rebound of the absorber is snubbed by the closing of the valve 9, which limits the return flow of oil to a $\frac{1}{8}$-inch diameter bleeder hole in the ring valve.

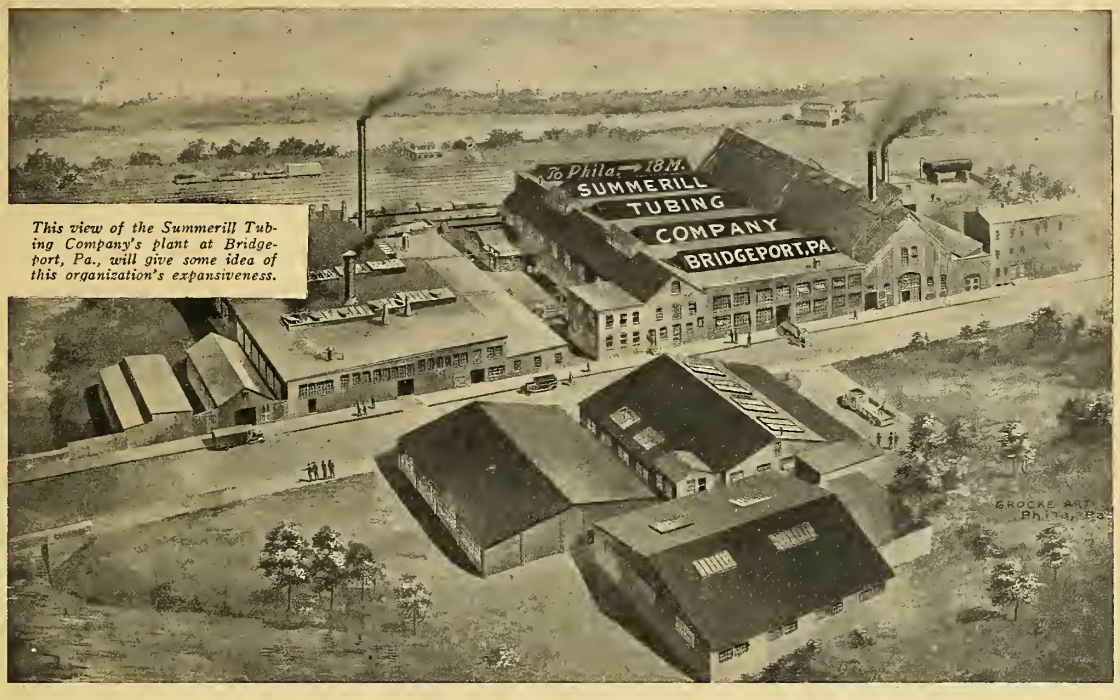
This absorber may be readily adjusted to load variation by varying the air pressure in the cylinder.

The Curtiss oleo-rubber gear consists of a stack of rubber compression disks centering about two telescoping tubes. The lower tube is also an oil reservoir, and when the leg is compressed a quantity of oil is trapped and forced to bleed back very slowly, thus effectively damping the rebound. While the maintenance of this type of shock absorber is very low and its operation excellent, the device as a whole is heavy and not well adapted to good streamlining. The rubber disks have been giving considerable trouble.

The oleo-spring device consists of a cylinder and a piston, with the piston held near the top of the stroke by a spring. The Keystone Aircraft Corporation has developed this type of gear and has successfully applied it to its light bombers. It is illustrated in the assembly drawing of Fig. 2. The landings are smooth, with no particular recoil.

The springs compress a little more than half their total travel, so that when coil to coil they exert about 1¾ times the weight of the plane. This gives easy taxiing and yet it has been observed by the grease line on the rods that they never get fully compressed in ordinary flying. When in flight the weight of the gear pulls the pistons clear of the springs and to the top of the cylinder. When

(Continued on next page)



This view of the Summerill Tubing Company's plant at Bridgeport, Pa., will give some idea of this organization's expansiveness.

THE SUMMERILL TUBING COMPANY — founded in 1899 — is now devoting an *entire unit* of its plant exclusively to the manufacture of aircraft tubing.

Concentration of effort, in this highly specialized field, coupled with the inflexible standard of *quality* that has been of paramount importance since the inception of the business — has resulted in a nation-wide response so enormous as to require increased facilities and augmented personnel.

That industry the world over appreciates the importance of this policy is demonstrated by the fact that the *Summerill Tubing Company* is serving practically every aircraft manufacturer in the United States in addition to some abroad and should be a convincing testimonial to the quality of its products.

The *Summerill Tubing Company* is prepared to co-operate with you on your particular problem, be it large or small, and a competent staff of engineers and metallurgists is at your disposal.

Booklet — "Aircraft Tubing Data" mailed upon request addressed to Dept. A

SUMMERILL TUBING COMPANY

Bridgeport, Pa.

SUMMERILL SEAMLESS TUBING

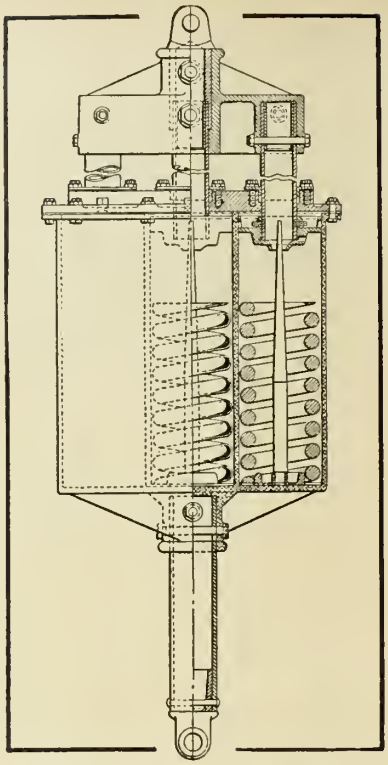
Warehouse stocks made to Government Specifications

Round, streamline and other special shapes

(*Continued from preceding page*)

a landing is made the first shock must force oil through a $\frac{1}{32}$ orifice, which is gradually closed by a tapered needle as the piston goes down. At the bottom of stroke of about 6 in. the orifice is a mere slit $\frac{1}{32}$ in. wide. Deceleration is by this means kept very close to constant and minimum loads are imposed on the fuselage structure. As the oil passes through the orifice, it flows through the four 3/6-in. diagonal holes to the space between rod and cylinder above the piston. The approach to the orifice is belled on top to prevent contraction and give quicker flow in the return direction or down, and it is not belled on the bottom, in order to produce as much contraction as possible, in the up direction of flow as in landing. The shock gear for bombers is composed of three cylinders. The pressures in the oil are, of course, rather low. Perhaps three times as high pressures could be carried with safety and economy of weight of oil and cylinders, but the spring would then have to be housed and kept from rusting.

The oleo-gravity return type of shock absorber consists of a cylinder filled with oil in which a piston operates and the energy is dissipated by forcing the oil from one side of the piston to the other through an orifice of constant area. When the end of the stroke is reached, the cylinder bottoms against a rubber pad or steel spring supported from the piston, and this together with the tire provides resiliency for taxiing. The major difference between this type of shock absorber and the others, is that by correctly proportioning the cylinder, stroke, and orifice size, all of the energy of impact can be dissipated by the oil and not stored in the rubber, steel, or air springs. Consequently, the energy to produce rebound does not exist and it is not necessary to complicate the design to take care of it. Whereas the other gears have springs of various types to return the piston to the "charged" position, this shock absorber depends upon gravity alone for this all-important function and prior to flight test considerable doubt existed as to its efficacy.



Keystone Oleo-Spring Landing Gear

The Barling bomber was the first Air Corps airplane to employ an oleo gear. The front wheels of the landing gear on this airplane were equipped with a long-stroke, non-return type of oleo. When the airplane was taken off, these wheels dropped below the other wheels due to their own weight. When the airplane was landed these wheels came in contact with the ground first and the oleo cylinder absorbed the shock. Since there was no spring or other means of returning the cylinder to the extended position there was no tendency to bounce except that due to the deflection of the tires.

A few years ago the Air Corps designed and built a gear of this same type for the XO-2 airplane. In addition to the regular flight tests an elaborate series of laboratory tests were made with one oleo leg.

The fundamental problem now of major concern resolves itself about the flow of oil through orifices. If springs also are used, more or less orthodox methods exist to calculate them. Test data have been obtained on rubber compression disks with various combinations of aluminum spacers ranging from no spacers up to one between each disk. Although discussion of these data is outside of the scope of this paper, it may be said that the addition of spacers materially reduces the deflection for a given load. The spacers keep the rubber disks from tending to "ooze out," so to speak.

For a given allowable maximum instantaneous value of deceleration the ideal and most efficient landing gear is one with a constant resisting force throughout the stroke. In other words, the indicator card of the cylinder should be a rectangle. Standard Air Corps test requirements call for each leg withstanding half the load in a 42-inch drop. A compromise then between a desirable deceleration under a stipulated maximum and the bulkiness and weight of the cylinder and piston determines the size of the best gear.

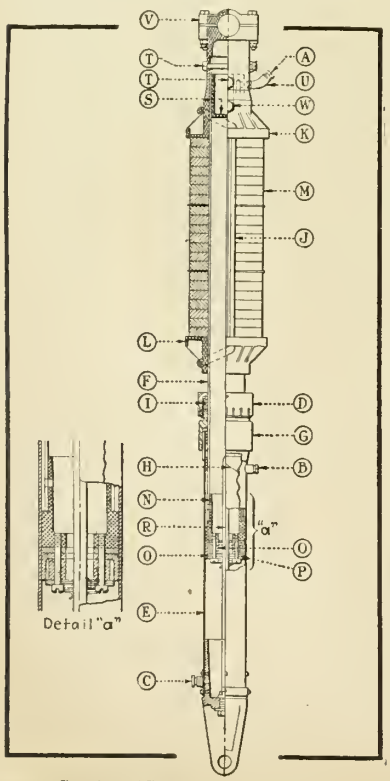
A thesis by Sydney Berman conducted at the Massachusetts Institute of Technology in May, 1927, had for its purpose the investigation of the flow of different oils through the same orifice, of the flow of the same oil under different temperature conditions through the same orifice; and lastly of different oils passing through orifices of different shapes.

Berman shows that for orifices in the neighborhood of $\frac{3}{8}$ by $\frac{3}{8}$ in. as commonly used in landing gears, under a pressure of 50 lb. per sq. in., viscosity has no effect on the flow of fluids.

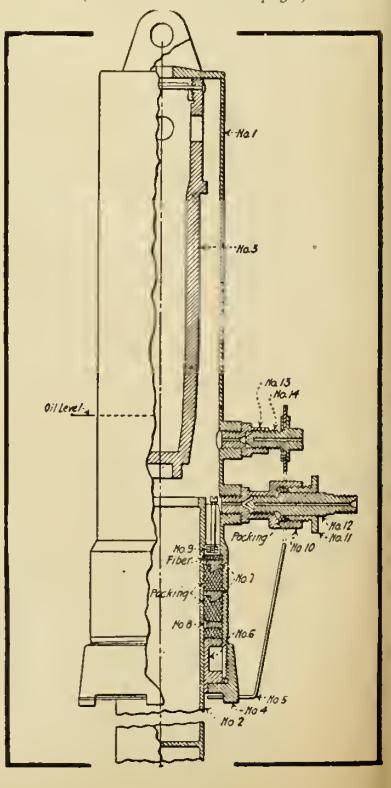
As the orifice increases in diameter the coefficients also increase, those for the less viscous fluids increasing at a faster rate.

Berman did, however, find that if the orifice area (that of a hole $\frac{3}{8}$ in. in diameter) was replaced by 5 small holes whose total area equalled that of the $\frac{3}{8}$-in. hole, the law of flow did vary with viscosity. With the normal oils (Mobile A) there was no material difference, but with the heavy grease

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Curtiss "Condor" Oleo Strut



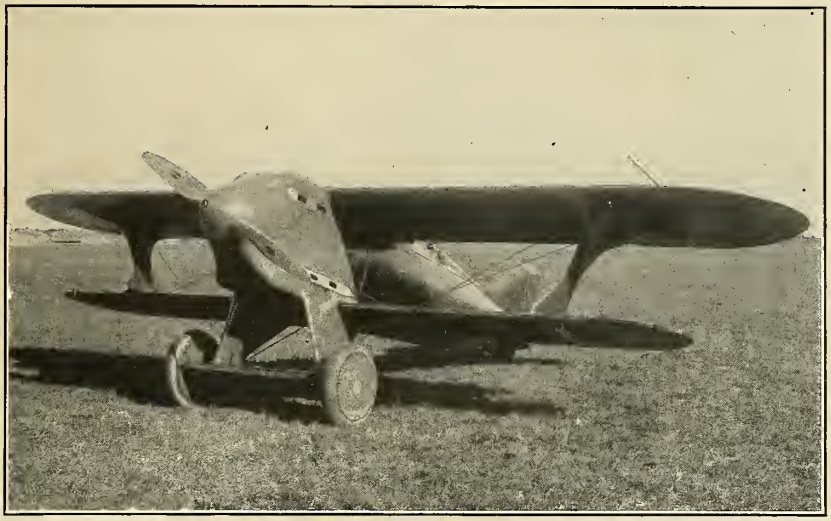
Vickers Oleo-Pneumatic Shock Absorber

Nothing is apt to cost so much as a bearing that cost so little

You men who plan, build, use or pay for machines of any kind, remember this: It costs more to replace a poor bearing than to buy the best one that SKF ever produced. AND SKF ANTI-FRICTION BEARINGS ARE THE HIGHEST PRICED IN THE WORLD.

SKF Puts the Right Bearing in the Right Place

ANOTHER APPLICATION OF SKF BEARINGS IN AVIATION



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HURTLING through the air at nearly 290 miles an hour! Terrific speed beyond the compass of the average individual's vision. Yet, such was the record made in the plane shown above, owned and built by Lt. Alford J. Williams. It is the fastest time ever made by a plane built or flown in the United States.

To withstand this gruelling service hour after hour calls for the finest in ball bearings—where performance is considered above price. For the propeller thrust and other important locations on the motor—SKF Ball Bearings were first choice. And the same has been true on every epoch making flight in the past decade—SKF have ably demonstrated their superior reliability and endurance.

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SKF

THE HIGHEST PRICED BEARINGS IN THE WORLD

(*Continued from preceding page*)

a decided difference was apparent; about 61 per cent as much passing in unit time through the small holes as through the large hole.

By immersing the orifice, the coefficient of flow was slightly decreased, while a small needle in the orifice had little effect on the coefficient, although it did prolong the time of flow. Tapering a needle would hardly effect the flow unless the taper were of the magnitude of 1 to 50. Having various heads to the needle would not alter the flow whatever, as the head was only in the orifice for an interval of time. Tapering the orifice increased the coefficient, the coefficients increasing at a faster rate with fluids of a lesser viscosity. By extending the orifices into a nozzle, the coefficients decreased faster with fluids of a higher viscosity than those with a lower viscosity.

For future work in oleo-gear design, this investigation shows that a practicable orifice to use is the ⅜ in. diameter ⅜ in. deep. Using this particular orifice, the coefficient of flow of any medium remains practically constant regardless of its viscosity up to 100,000 seconds Saybolt.

Berman's tests indicated that changes in temperature of any oil were found to affect the flow very little. But air-mail pilots operating on the transcontinental mail route during winter months report a decided sluggishness of the hydraulic gear. It is likely that this refers to the return stroke, which Berman was unable to observe. It is not uncommon to have operating temperatures below zero deg. Fahr., such that the oils used in the gears get very sluggish and the viscosity increases. It would seem therefore that the viscosity of the oils used in the gears should be changed with the seasons.

At the McCook Field experiment station, extensive laboratory and flight tests were conducted for the XO-2, Douglas observation airplane. A weight corresponding to approximately ½ the load the leg would take in service was dropped varying distances on the oleo leg up through 42 in. Slow-motion pictures were taken of the action of the leg in all these tests. In addition to the results of slow-motion pictures a steam-engine indicator was attached to the oleo cylinder and pressure-stroke cards were obtained on the various drops. These tests were made first with the oleo leg alone, and later were made on the leg, tire, and wheel combined to simulate the actual conditions obtained in flight service. The indicator cards and slow-motion pictures gave a complete story of what was taking place in the cylinder during a test. These tests gave a great deal of information on the action and possibilities of oleo shock absorbers. The ideal condition for an oleo leg is constant resisting force throughout the stroke. The indicator cards showed how closely the leg under test was approaching this ideal.

As a result of these experiments it has been found that the practically ideal card is obtainable without the throttling needle if the tire and wheel are used. Also the tests showed the formula by Dowty gave too large an orifice until the coefficients obtained from Massachusetts Institute of Technology tests were used. This is due in part to the approximate assumption regarding the variation of the velocity of the piston along the stroke, when the initial velocity is taken as the vertical velocity at impact.

An interesting "mechanical" leg bearing a resemblance to the above oleo gears is the Beardmore-Shackleton leg. It uses helical springs with a mechanism of wedges actuating blocks against a Ferodo friction surface lining that part of the cylinder.

The Curtiss Aeroplane & Motor Company has under experimental development a self-contained wheel-brake and oleo shock absorber combined. The advantage of this is obvious—it provides a quickly replaceable unit; it allows better streamlining of the landing-gear struts as well as subjecting them to less shock.

Conclusions

The criterion for landing gears cannot be height of drop alone, but should include the allowable maximum instantaneous deceleration. Tests for variation of orifice coefficients should be undertaken for a range covering tropical to arctic service temperatures. There seems to be no particular reason why it should not be possible to develop further the safety of aircraft by designing a landing gear capable of absorbing the shock of landing from certain kinds of stalled flight. It is possible to calculate to the first approximation any kind of oleo gear for aircraft. On account of the variables involved each complete new installation usually requires drop testing for refinement.

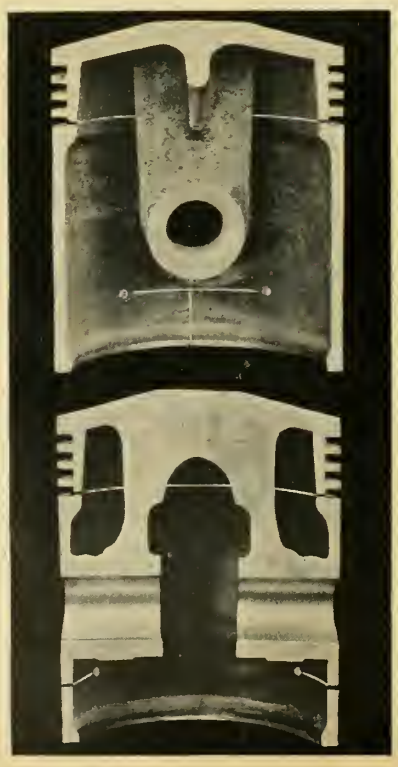
DYCER-AUSTIN ALLOY PISTON

THE Dycer-Austin aluminum alloy piston has the same weight as the stock piston it replaces. There are four ⅛ inch ring grooves; three compression and one oil wiper ring. The design of new production aircraft engines takes cognizance of the fact that a narrow ring is more efficient, supplying greater compression, less friction and drag and less cylinder wear. A narrow ring is particularly advantageous for use in worn cylinders as reasonable efficiency is gained even in the presence of off-center operation.

In regard to oil consumption, a 25 per cent increase in economy is realized due to closer fit of piston and the use of narrow rings. Pistons are made with ⅛ inch higher head supplying greater horsepower and more revolutions to the OX5. Dycer-Austin pistons are also supplied with standard head when desired.

Expansion of the detached head spreads the bosses apart and contracts skirt thus rendering the piston round under operating temperature. The piston skirt is turned oval .003 with the smaller diameter in the same axis as the piston pin. As demonstrated by three years of service, there is no danger of the piston warping.

Due to the connecting strut the detached head adds 16 square inches of heat radiating surface to the piston thereby permitting a cooler operating temperature to the piston, rings and cylinder walls.



Sectional views, Dycer-Austin piston.

The cut at bottom of skirt absorbs expansion, consequently preventing seizing in event of overheating due to lack of oil, etc.

The slot serves to drain oil and prevent the travel of heat from the head to the skirt.

Dycer Airport has used the special Dycer-Austin pistons in its own engines for some time. They have been in production since the first of the year. The high compression feature is interesting to the commercial plane owner today due to the increased efficiency realized with small cost. Incidentally, the motor requires overhauling at less frequent intervals due to its increased revolutions after overhaul and the extension of time before arriving at the usual overhaul period.

SPRAY TEST FOR MICARTA PROPELLERS

IN order to determine the erosive effect of spray on Micarta propellers, so that effective protective measures can be taken, the Westinghouse Electric and Manufacturing Company is making tests at the East Pittsburgh Works.

A model propeller, with and without metal tipping, is being run at 4,000 r.p.m. in a spray of water from a perforated pipe. The Westinghouse Company has undertaken this test with a view to developing the ideal propeller for seaplanes.

When You Use PROGRESSIVE AIRCRAFT FINISHES Here's What You Get!



Squarely behind every Progressive Aircraft Finish stands an organization keyed to the airplane industry. One of the first, if not the first manufacturer, to recognize the commercial importance of aviation, Berry Brothers created an aviation division, headed by an enthusiast and one who has been in the paint industry from boyhood.

Progressive Aircraft Finishes are the combined result of intimate contact with leaders in the aviation industry and 70 years of manufacturing experience brought to bear on the development of new finishes and new finishing methods.

Berry Brothers is constantly widening the scope of its service to the aviation industry. The services of a practical demonstrator are now at the command of manufacturers seeking utmost beauty and durability in finishes for their ships. An experienced painter, this man for the past several years focussed his attention on aircraft finishing.

Exclusive aeronautical representatives are contacting plants throughout the country. Experimental men are constantly working to keep Progressive Aircraft Finishes several steps ahead.

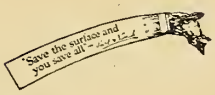
Berry Brothers present position in the aviation continue to merit

PROGRESSIVE AIRCRAFT FINISHES

has earned its of dominance industry and will your regard.



More complete thon ever and with certoin importont revisions, "Specifications for Aircroft Finishing" is now in its third edition. Write for it ond receive the benefit of the latest thought in airplane finishing methods.



Progressive Aircraft Finishes carried in stock for immediate shipment by

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Manufacturer of Progressive Aircraft Finishes

THE SHORT "CALCUTTA" COMMERCIAL FLYING BOAT

THE Calcutta was built by Short Bros. to the order of the British Air Ministry for operation by Imperial Airways. The constructors' aim has been to produce an aircraft to fulfill modern requirements in the way of passenger accommodation combined with maximum safety. The aircraft is fitted with three engines, on any two of which it will fly, thus practically precluding the possibility of a forced landing. The machine is entirely of metal with the exception of the covering surfaces.

Duralumin is the material chiefly used in the construction in conjunction with stainless steel fittings; the completed machine representing the first all-metal commercial aircraft to be constructed in England.

Special attention has been paid to the water performance of the hull, the lines of which have been developed after considerable research in Short Bros. testing tank, and it is claimed that the performance in the water of the hull in its final form is unequalled by any other flying boat yet built.

Three Bristol "Jupiter" engines each developing 485 h.p. at 2,000 r.p.m. are mounted in line in separate nacelles between the wings and arranged as tractors.

Oil tanks are situated in the nacelles, connected to the external oil coolers with a capacity of 45 gallons. A Bristol engine starter is installed in the centre nacelle coupled up to all three engines. This starting engine has also been arranged to drive a mechanical bilge pump and the general purpose dynamo for lighting and wireless services when the main engines are not running.

The fuel is carried in two tanks in the upper plane, the engines being fed entirely by gravity. The fuel system is so arranged that any engine can be fed from either tank. Gasoline capacity, 480 gallons.

The pilots are accommodated side by side in a roomy cockpit in the bow of the hull. From this position an excellent view is obtained in all directions, and by making the starboard control column detachable the assistant pilot is able to obtain access to the extreme bow for mooring purposes, a hinged hatch being provided.

The second pilot, who also combines the duties of navigator and wireless operator, is provided with a compartment immediately aft of the pilot's cockpit, and is shut off from it by a roller blind. This compartment, which contains all the wireless instruments, is fitted with a table with drawers for charts, etc. and is so arranged that the operator is able to carry out his duties with complete freedom of action.

The main passengers cabin is extremely roomy, being 17 feet long, 6 feet 6 inches wide and 6 feet 3 inches high; the passengers are arranged in rows of three with a gangway slightly off centre. Comfortably upholstered seats are provided, also constructed of metal and fitted with cushions arranged to be used as lifebelts in case of emergency. Each seat is also fitted with a collapsible table.

The seats and lower sides of the cabin are covered with antique pattern leather, and the roof is covered with a wool head lining. The sides of the cabin are provided with large plate glass windows. A duct is fitted along the top of the cabin which carries the lighting cables, and also serves as the fresh air duct, the duct being connected by pipes leading to the cowls fitted in the hull, the supply of fresh air being regulated by valves fitted on the underside of the duct.

A buffet is fitted at the rear end of the cabin under the charge of a steward, the buffet being complete with oil cookers and an ice chest for the dispensing of either hot or cold refreshments. As no fuel is carried in the vicinity of the hull, smoking is permitted.

A lavatory compartment is also provided completely equipped with wash basin and an adequate water supply for drinking, washing and flushing purposes.

Access to the cabin by the passengers is effected through a hatch at the forward end of the compartment, so arranged that the passengers can step direct from the flying boat to the quay to which the boat is moored. A separate hatch is provided aft for the purpose of loading the luggage, thus the baggage and passengers can be embarked simultaneously.

The seats are so arranged as to be readily removable if mails are required to be carried in the main cabin.

The aircraft is fully equipped with wireless receiving and transmitting gear. Under normal atmospheric conditions the range of the transmitter from the aircraft to the ground with good readable signals is approximately as follows: For C. W. telegraph, 300 to 400 miles; for telephony, 200 to 250 miles; for tonic train telegraphy, 240 to 280.

An emergency aerial is fitted on a telescopic mast attached to the upper plane for use when the aircraft is moored in harbor, or makes a forced landing.

Fore and aft Bellini-Tosi loops are fitted for direction finding.

Provision is made and equipment provided for the removal and refitting of the engines whilst the aircraft is afloat by means of a gantry fitted above the nacelles.

For the purpose of transporting the aircraft on land a beaching chassis has been

(*Continued on next page*)





The Short "Calcultta" commercial flying boat in flight



Taking passengers aboard the giant "Calcutta" flying boat



ALMOST IMMEDIATE DELIVERY ON AMERICAN EAGLE PLANES

THE American Eagle Aircraft Corporation is pleased to announce that, despite a phenomenal growth in sales, it is now prepared to assure immediate delivery on orders for American Eagle 3-Place Biplanes. . . . Furthermore, this organization, firmly believing that no properly financed aircraft builder can find reasonable excuse for delayed deliveries, pledges that, insofar as possible, with precision manufacturing methods, its production shall keep step with the rapidly increasing demand for American Eagle Planes.

IMMEDIATE delivery of American Eagles has been made possible solely through improvements in production facilities. . . . for American Eagle sales are increasing tremendously. Ships delivered in June total *TEN TIMES* the number delivered in January.

Our record for the first six months of 1928:

January .....Three Planes Weekly
February .....Four Planes Weekly
March .....Five Planes Weekly

April.....Nine Planes Weekly
May .....Twelve Planes Weekly

June.....TWENTY Planes Weekly
July (Estimated) . . . .TWENTY-FIVE Planes Weekly

A ship completed, tested and ready for delivery every 150 minutes in June! . . . A ship delivered every 130 minutes in July!

Distributors, dealers and owners alike will appreciate the particular significance of this unique accomplishment, in view of the fact that no detail of design, materials, construction or inspection has been sacrificed to increase production.

The American Eagle Aircraft Corporation and American Eagle Distributors are glad—just as they have been in the past—to match performance with any ship in recognized air meets, confident that the American Eagle is more than ever the outstanding plane in its power and price class.

Valuable sales franchises are available in certain territories for forward-looking, well-financed distributors and dealers.

AMERICAN EAGLE AIRCRAFT CO.
2808 EAST THIRTEENTH ST.
KANSAS CITY, MISSOURI



(*Continued from preceding page*)
designed consisting of two large aero wheels fitted slightly forward of the centre of gravity, and a tail trolley fitted at the rear step.

SPECIFICATIONS

Dimensions

Span, upper plane .....93 feet 0 inches
Span, lower plane .....76 feet 6 inches
Length overall .....64 feet 9 inches
Height overall .....22 feet 3 inches
Wing chord .....11 feet 6 inches

Areas (square feet)

Main planes, including ailerons.....1825
Ailerons (total) 150
Tail plane 112
Elevators (total) 105
Fin 56
Rudder (main) 49
Rudder (servo) 7.6

Weights (pounds)

Weight fully loaded 20,500
Weight empty 12,804
Weight available for load 7,696
Loading per square foot 11.23
Loading per horsepower 13

Useful load (pounds)

Crew (3), baggage, food and water.....750
Passengers, baggage, food and drinking water; 15 at 236 pounds per head....3,540
W-T transmitting, receiving and direction finding 430
Electrical equipment; instruments, fire extinguishers, etc. 90
Very pistol and cartridges.....14
Cooking equipment 40
Seagoing equipment 102
Gasoline (320 gallons) (.76 S. G.)....2,430
Oil (30 gallons) (1.0 S. G.).....300
Total 7,696

Performance (actual)

Maximum speed at sea level
126 miles per hour
Cruising speed.....100 miles per hour
Landing speed .....57.5 miles per hour
Climb at sea level .....750 feet per minute
Service ceiling .....13,500 feet
Time to 10,000 feet....21 minutes 30 seconds
Range (320 gallons fuel at 100 m.p.h.)
500 miles (6.4 hours)
Range (480 gallons fuel at 100 m.p.h.)
760 miles (10 hours)

HALLETT 130 HORSEPOWER ENGINE

THE Hallett Manufacturing Company of Los Angeles, California, has completed and started operations in the first unit of a new factory which they are constructing in Inglewood, California, for the manufacture of aircraft engines. Production has been started on 50 engines.

This company has, for the past two years, been developing a seven-cylinder, static, radial, air-cooled aviation engine which develops 130 h.p. at 1,800 r.p.m. It is equipped with special composition grey iron cylinders. It has a 4⅜ inch bore and 5 inch stroke with a 526 cubic inch displacement and weighs 425 pounds without the propeller hub.

The average gasoline consumption at 1,500 r.p.m. is six gallons per hour. The lubricating system consists of a pressure and scavenging pump located on the rear of the engine and is readily removable. Oil is fed under a pressure of 100 pounds per square inch. The push rods and rocker arms are of conventional design except that the rocker arms are mounted on Timken bearings. The crankshaft which rotates in an anti-clockwise direction, is one piece and is mounted on Timken bearings, front and rear, which take the thrust in either direction. The master rod is of two piece construction and mounts on the crankshaft with a bronze babbitt lined bearing. The articulating rods are attached to the master rod using bronze for bearing material. The wristpins for the articulating rods and for the pistons are identical in size and are, therefore, interchangeable. The pistons are of a special aluminum alloy manufactured in their own factory. The engine is equipped with two Splitdorf magnetos, one of which is equipped with impulse coupling which insures easy starting. The magnetos are readily adjustable by a splined coupling. The Zenith carburetors are mounted on the rear of the engine and are easily adjustable.

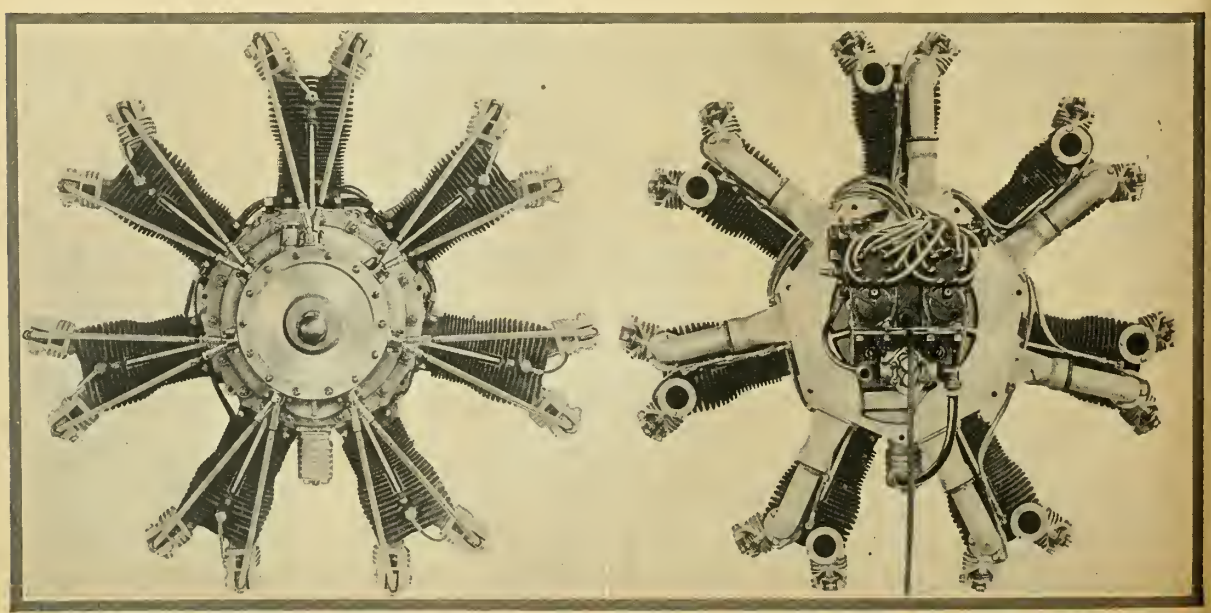
The propeller hub is mounted on the tapering end of the crank shaft and is held from turning by a key. The hub is forced onto the taper by a nut which is held from coming off by a special locking device.

The engine can be disassembled, completely, including the removal of the crankshaft and all units, without being removed from the plane and requires no special stand for overhauling work on the field. The engine has an overall diameter of 47 inches and an overall length of 37 inches.

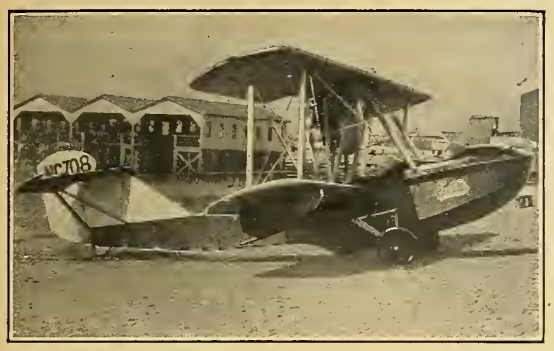
The motor has completed 45 hours of testing which was done in 5 periods. The maximum cylinder head temperature throughout this test was 350 degrees which is very low considering that the engine was cooling itself with a propeller at the same time absorbing power.

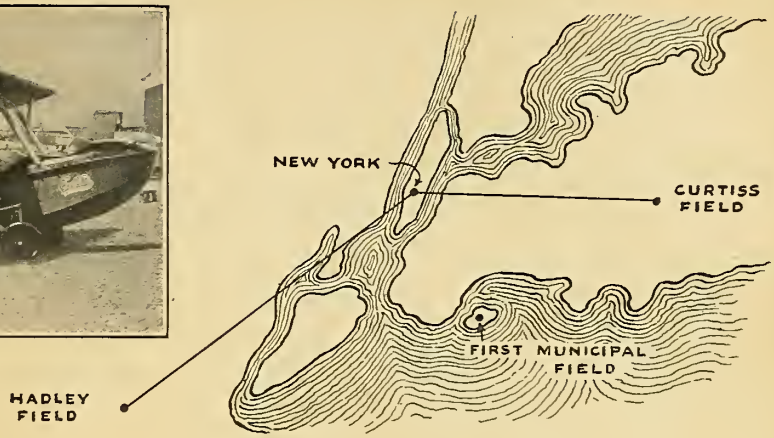
Specifications

Displacement .....526 cubic inches
Compression ratio 5.2
Brake horse power 130
Normal engine speed .....1,800 r.p.m.
Firing order 1-3-5-7-2-4-6
Weight complete .....425 pounds



Front and rear views of the Hallett engine showing its clean lines, small frontal area and accessibility





From airport to city is where time is lost

Most airports are necessarily removed from the heart of the city. That means delay and traffic congestion getting to and from the flying field. Frequently most of the time gained in flying is lost at the beginning or end of the journey. The same applies to mail and express.

Most large cities are situated on water . . . the ocean, a lake or a river. And that water is usually close to the heart of the city. Rapid transit to airports is still a thing of the distant future and even that will have its drawbacks. The air is the only clear thoroughfare.

To facilitate the transport of passengers, mail or express, operators feel the need of shuttle air lines from airports to the centers of cities. To increase the traffic it is necessary to provide this additional air service. And Amphibians are the only solution.

The Ireland Amphiplane is the only ship of its kind in production. A practical sea and land plane that carries exceptional pay loads and provides comfortable passenger facilities for four besides the pilot.

Fast, efficient, very maneuverable, and safe, the Amphiplane affords more adaptability and service latitude than any ordinary aircraft. Facility in landing is not only greater than in any other type of plane but becomes a talking point in air transport operations.

Ireland Amphiplanes have been thoroughly tested in service. There is no guess work about what they can do or stand . . . they are proven aircraft . . . all the "bugs" are out. Deliveries are being made with reasonable promptness.

It takes 1½ hours to get from Hadley Field to Penn. Station, New York by rail (35 miles). It requires 1 hour from Curtiss Field (20 miles). It takes longer by motor . . . a tremendous waste of time and great inconvenience. Air traffic is impeded, mail and express are slowed up.

With an Ireland Amphiplane, 4 passengers from Hadley Field can be landed at the Battery or anywhere else on water around Manhattan in about 25 minutes.

Lambert Field is 15 miles from business St. Louis.

Municipal Field is 9 miles from business Chicago.

Ford Airport is 7 miles from business Detroit.

Municipal Field is 8½ miles from business Cleveland.

Ireland Amphiplane

Wright Whirlwind J-5-C, 220 H.P.
Curtiss Reed Propeller, pusher type
Hull and Tail of steel tubing welded
Hull Covering, non-corrosive alclad
High speed, full load, 94 m.p.h.
Cruising speed, loaded, 80 m.p.h.
Landing speed, loaded, 45 m.p.h.
Take-off from water, 30 seconds
Take-off from land, 12 seconds



IRELAND AMPHIPLANE

Flies in the air, floats on water, taxis on land

Ireland Aircraft, Inc., Curtiss Field, Garden City, N. Y.

PERFORMANCE OF FAIRCHILD AIRPLANES

THIS report contains all the reliable flight test data accumulated to date on the FC-2 (Whirlwind) and the FC-2W (Wasp) models.

The following tables give the tabulated figures, and are self-explanatory. Any additional data may be read from the accompanying charts. The plot on Fig. 1 gives the time-altitude and rate-of-climb curves for the FC-2 (Whirlwind) landplane, with full load, and also with photographic load. The rate of climb at any altitude, or the time required to reach any altitude can be read directly from these curves for the two loads. This data has been corrected to standard atmosphere (59 degrees F. and 29.9 inches Hg. at ground).

The plot on Fig. 2 has been derived from that on Fig. 1, and gives the ceiling, rate-of-climb at ground, high speed, and landing speed for any gross load of the FC-2 (Whirlwind) landplane. The weight empty has been given on the chart, so that the performance can be obtained for any specified useful load. The data is corrected to standard atmosphere.

The plot on Fig. 3 gives the time-altitude and rate-of-climb curves for the FC-2W (Wasp) landplane, with a gross load of 4,525 pounds. The curves are similar to those on Fig. 1 for the FC-2, except that in this case the data has not been corrected to standard atmosphere.

The plot on Fig. 4 gives the same data (uncorrected) for the FC-2W (Wasp) seaplane, with a gross load of 4,600 pounds. It will be noted that the seaplane performance indicates a greater ceiling than the land plane, which is probably due to better running of the engine (the temperature being warmer), or to the fact that the seaplane was tested by the Canadian authorities with Canadian altimeters.

In comparing the FC-2W (Wasp) plots with the tabulated data note that the ceiling and climb values have been reduced to less than those actually obtained. This has been done to approximate the corrections to standard atmosphere, which have not yet been made.

FC-2W (Wasp) seaplane equipped with combined skis and floats, and loaded to 5,100 pounds gross weight, took off the water in 30 seconds and reached an altitude of 12,600 feet in 36 minutes. The time to 5,000 feet was 9 minutes, and to 10,000 feet was 21 minutes.

FC-2W (Wasp) landplane on its second flight reached a height of 19,500 feet (3½ miles) and a temperature of 26 degrees F. below zero. The cabin was sufficiently warm, however, for the observers to omit their gloves during the whole flight. This altitude was reached in 45 minutes with a useful load of 2,100 pounds.

FC-2 (Whirlwind) seaplane recently made a non-stop flight from New York to Miami, a distance of 1,275 miles, in exactly 12 hours. It took off with a gross weight of 4,375 pounds of which 1,925 pounds were useful load. The take-off run was less than 300 yards.

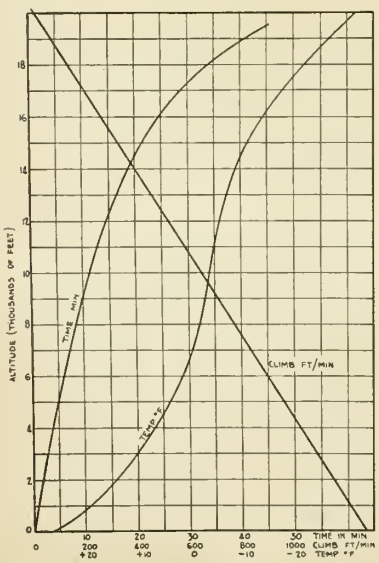
FC-2 (Whirlwind) landplane of standard production accompanied Col. Lindbergh on his recent tour of the United States. The plane covered a distance of over 20,000 miles.

TABULATED PERFORMANCES OF FAIRCHILD AIRPLANES

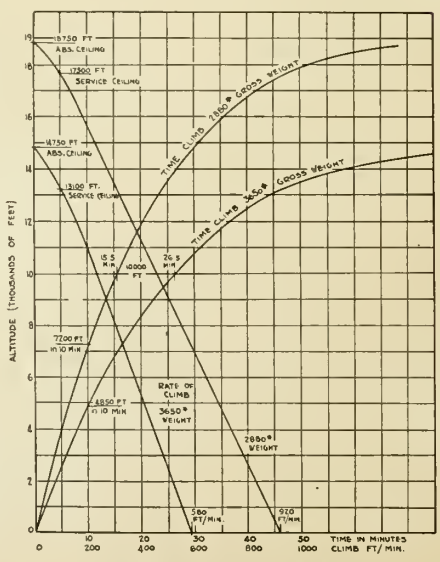
Airplane model	Model FC-2		Model FC-2W	
Engine	Wright "Whirlwind"		Pratt & Whitney "Wasp"	
Power	200 h.p.		420 h.p.	
Airplane type	*Landplane*	*Seaplane*	*Landplane*	*Seaplane*
Gross weight (pounds)	3650	3900	4600	4600
Weight empty (pounds)	2166	2412	2418	2770
Useful load (pounds)	1484	1488	2182	1830
Pay load (pounds)	800	750	1300	900
High speed (m.p.h.)	122	112	140	130
Landing speed (m.p.h.)	53	55	55	55
Cruising speed (m.p.h.) at 1600-1650 r.p.m.)	103	95	110	100
Absolute ceiling (feet)	14,750	14,000	19,500	19,500
Service ceiling (feet)	13,100	12,700	18,000	18,000
Initial rate-of-climb (ft. per min.)	580	420	1,210	1,020
Climb in 10 minutes (feet)	4,850	3,900	8,900	7,800
Time to 10,000 feet (minutes)	27	36	12	14
Range, with above load (miles *)	650	600	600	550
Range, full tanks (miles)	900	850	900	850
Fuel consumption (gallons per hour)	12	12	19	19
Fuel capacity (gallons)	110	110	160	160
Span, wings open (feet)	44	44	50	50
Span, wings folded (feet)	13	13	14	14
Length (feet)	31	33	31	34
Wing area (square feet)	290	290	332	332

These figures computed from extensive flight tests prior to January 1st, 1928.

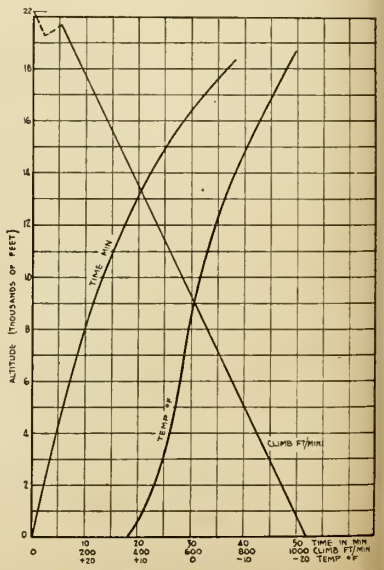
* *Pay load and cruising range depend on the amount of gasoline carried. The above figures based on 80 gallons for the FC-2 and 110 gallons for the FC-2W. The pay load for seaplanes has been taken as 50 pounds less than the landplane on account of the extra equipment usually carried for seaplanes.*



CLIMB AND ALTITUDE FC-2W #1 Land plane.
Not corrected to Standard Atmosphere. 12-9-27



CLIMB FC-2 Land plane.
Corrected to Standard Atmosphere. 7-25-27



CLIMB AND ALTITUDE FC-2W #1 Seaplane.
Not corrected to Standard Atmosphere.

4 -IN LINE- SCORPION AIR COOLED
REGISTERED TRADEMARK

AERONAUTICAL PRODUCTS
CORPORATION
MANUFACTURERS
NAUGATUCK, CONN., U.S.A.

The Aeronautical Public—

Gentlemen:

We take pleasure in offering for your approval, our new creation for light planes—100 H.P., 4 cylinder-in-line, air cooled, overhead valve engine, weighing 290 lbs., with 2 magnetos and carburetor.

This is a high grade unit in every particular—steel forged cylinder barrels, alloy heads, salt filled exhaust valves, silichrome, tulip inlet, aluminum bronze seats.

The entire valve action is oil tight with oil circulating through—only possible with our patented Cantilever springs.

It can be mounted in all existing types of ships and the price is only $1825.

We have named it the SCORPION, after the ancient Catapult guns.

And it will always be as good as men and material can make it.

Yours very truly,

AERONAUTICAL PRODUCTS CORPORATION

Henry J. Thomson

President

ALL MATERIALS U. S. AIR SERVICE REGULATIONS

QUOTATIONS SUBJECT TO CHANGE WITHOUT NOTICE. ALL AGREEMENTS CONTINGENT UPON STRIKES, ACCIDENTS AND OTHER CONDITIONS BEYOND OUR CONTROL

Say you saw it in AERO DIGEST

AIRCRAFT ENGINE SUPERCHARGERS

By A. L. BERGER
In Charge of Supercharger Work, Materiel Division, Air Corps

THE purpose of a supercharger as applied to aircraft engines is to fully or partially restore sea level density before the air enters the engine cylinders, thus restoring sea level conditions both as to air density and power output. In a broad sense, a supercharger is simply an air compressor constructed in a form suitable for use in connection with aircraft engines and designed for a capacity and compression ratio which will meet requirements of the engine at any specific altitude.

The power that an airplane engine develops varies with the density of the air entering the engine cylinders. An engine that will deliver 400 horsepower at sea level will deliver less than 200 horsepower at an altitude of 20,000 feet, due to the fact that the air at that altitude has less than half the density of the air at sea level. Therefore, if an engine operating at 20,000-foot altitude is supplied with air at sea level density it will again deliver its original 400 horsepower.

The function of the supercharger is to supply this air to the engine. Figure two shows diagrammatically how a supercharger operates. The exhaust gas is lead through manifold *a* into nozzle box *b* containing a semi-circular ring of nozzles *c*. The gases expand as they pass through the nozzles and acquire a high velocity before entering the buckets of the turbine wheel *h* which at the rated capacity of the supercharger is driven at 23,000 revolutions per minute. The impeller *d* is mounted on the same shaft as the turbine wheel and rotates in an aluminum casing *e;* the inlet air is taken in at the center of the compressor *j* and due to the rotation of the impeller attains a high velocity which is converted into a pressure through the diffuser vanes and leaves from the top of the casing to the carburetors *k*, from which point normal operation is again prevalent. When air is compressed its temperature is raised. For this reason the actual supercharger air passage *f* is replaced by an air cooler which again lowers the temperature of the air to a temperature sufficiently low for satisfactory engine operation. The speed of the turbine wheel and hence the amount of supercharging is controlled by a waste gate *g* located at the rear of the nozzle box. By opening or closing this gate the exhaust gases can either be allowed to escape to atmosphere or can be directed against the turbine wheel. An illustration of a turbo-supercharger mounted on a 400 horsepower Liberty engine is shown in figure five.

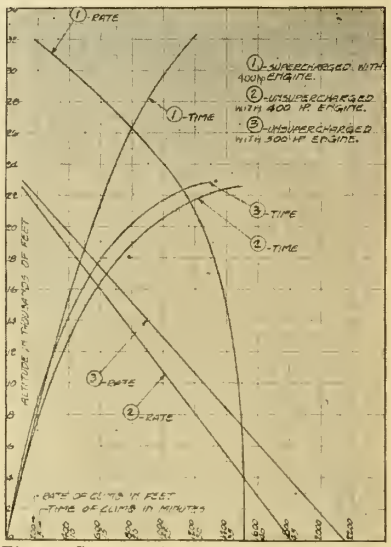


Fig. 1—Comparative performance between airplanes of the same type with supercharged and unsupercharged engines.

The results which are being obtained with apparatus of this type are rather remarkable and by referring to figure one some idea of the increase in airplane performance when equipped with a 20,000-foot supercharger may be obtained. This figure illustrates the comparative performance in time of climb and rate of climb between supercharged and unsupercharged airplanes of the same type and load. In general, the results of improved airplane performance may be classed in the following manner:

a. Increase in airplane ceiling by fifty per cent to seventy-five per cent.

b. Increase in speed and maneuverability at high altitude for pursuit airplanes.

c. Makes possible two-place fighters and photographic ships for high altitude duty.

d. Makes possible high altitude cruising for offensive bombing squadrons.

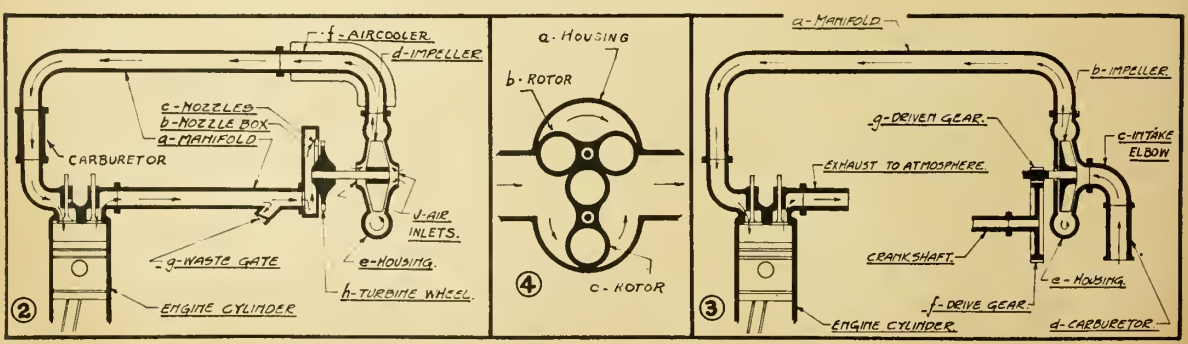
The investigation and development of air compressors or superchargers by the U. S. Army Air Corps is being carried on along two lines: namely, the centrifugal type (including both the turbine and gear driven units) and the Roots or rotary displacement type.

In the centrifugal type the compressing elements are practically the same for both the turbine and geared types, their primary differences being in the method of driving. In the case of the turbine driven centrifugal compressor the potential energy of the exhaust gases is controlled and made available for power to drive the turbine; while in the case of the geared type the power to drive the supercharger is taken directly from the engine crankshaft; the engine connection is usually made by means of a clutch or flexible coupling. The Roots supercharger is of the displacement type and by referring to figure four the principle of operation of this type may be seen; the power for this type of unit is taken directly from the engine crankshaft.

The centrifugal type of compressor is essentially a high speed machine and although the normal speed rating is in the neighborhood of 23,000 r. p. m., speeds of 35,000 to 40,000 r. p. m. have been obtained. Its extreme simplicity and compactness is remarkable when it is considered that the units shown in figures five and seven are capable of handling an inlet air volume considerably in excess of 1,600 cubic feet of air per minute.

The rotary compressor illustrated in figure four is operated at speeds up to 6,000 r. p. m., is slightly heavier than the centrifugal type and its reliability is primarily due to low r. p. m.

The salient features of both types are reliability, low weight, flexibility and adaptability. The construction is comparable to all standard aircraft practice, requiring the maximum unit strength at the lowest possible weight. This is accomplished by using



Operating diagrams of superchargers: Fig. 2—Pressure type; Fig. 4—displacement type; Fig 3—suction type.


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For Performance with Economy the airwise have turned to the Alexander ship. The new center section design, less motor and propeller, is priced at $2250, on factory field. The new detachable motor mount will take any motor—water or air-cooled—90 to 260 horsepower.
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Colorado Springs, Colo.
DIXON

aluminum, duralumin and magnesium metals wherever possible. The use of these metals has permitted design and construction in which the total weight of the compressing units has been reduced to between 65 and 85 pounds as compared to approximately three tons for a commercial centrifugal compressor of the same displacement.

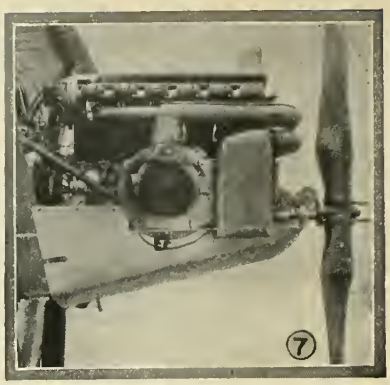
Two methods of supercharging are employed; first, the pressure type system as illustrated in figures two and five, and second, the suction type system illustrated in figures three and six. In the pressure type system the carburetors are located between the supercharger and engine and are operating under supercharger pressure at practically all times; while in the case of the suction type system the carburetors are located at the supercharger air inlet and are operating under normal atmospheric pressure. Both of these systems have their particular merits and the use of either one is practically dependent upon its adaptability to the installation in which it will be used.

The methods of controlling the supercharger output varies somewhat in the different types. In the turbine type the waste gate controls the volume of exhaust gases impinging on the turbine blades. By closing the gate the speed of the turbine and hence the amount of supercharging is increased. In the displacement type and direct driven centrifugal units the control is by means of a gate on the discharge side of the compressor, while in the case of the suction type the carburetor throttle acts as a control. The amount of supercharging is measured by a sealed altimeter or pressure gauge located in the cockpit and which indicates the engine altitude or pressure. With the airplane flying at 20,000 feet and the indicating instrument reading zero or sea level pressure it would mean that the carburetors were getting air at sea level density, and that the engine was operating under practically the same conditions that it would at sea level.

As a non-supercharged airplane ascends, the engine power and the power required to drive the propeller decrease in almost the same ratio. At a height of 20,000 feet, the propeller revolutions are little lower than they would be at the ground, while the power developed by the engine has been reduced to approximately 40 per cent of its normal output. With the supercharged engine, where the power is practically constant, the propeller tends to speed up with altitude and allows the engine to race. The variable pitch propeller, shown in figure seven, has not yet been perfected to a point where it can be used as standard equipment. Therefore, some compromise must be made by using a fixed pitch propeller. If a propeller is used which will allow the engine to develop approximately normal revolutions at the ground, the engine will over-speed at altitude. A larger propeller is therefore used, designed to give normal revolutions at some such altitude as 20,000 feet. The engine revolutions at the ground will be from 100 to 250 r. p. m. less than the rated r. p. m. of the engine, and the propeller r. p. m. will increase with altitude until the rated r. p. m. of the engine is reached at approximately the rated altitude of the supercharger.

In adapting a supercharger to an airplane a considerable number of other details must also be considered such as the cooling system, carburetors, fuel systems, spark plugs and ignition; also provision for supplying the pilot and crew with oxygen.

In general the development of superchargers has been through a continuous series of tests and refinements.



Centrifugal supercharger installation.

"BABY VISALIA"

By E. J. Carnes

A LIGHT monoplane recently completed by Jess Clark and Delmar Wood, Visalia youths, is creating considerable interest in central California. In its initial test flight, made by H. J. Kelsey, Visalia aviator, the little ship showed remarkable stability and performance qualities.

The thick wing, which has a span of 20 feet, is of spruce, with I beams and spruce truss ribs. Overall length is 14 feet, 11 inches.

Fuselage construction is entirely of welded steel tubing, as are the tail set and ailerons. Weight empty is 385 pounds.

A 28 h.p. Lawrance engine is used in the present model, a two-throw crankshaft having been installed in the power plant to overcome excessive vibration.

The landing gear is of split type, and fairly wide tread.

Take-off speed is 40 miles per hour, landing speed 30. On its first flight, heading into a 15-mile wind, the little plane took off in 36 paces. An indication of the lift obtained with this ship was the remark made by Kelsey upon landing that he had taken off at slightly more than half throttle. He stated that he was not at the moment ready to leave the ground, but was watching his oil pressure gauge, and, upon looking at the ground to get his bearings, found that he was already several feet in the air. The plane flew hands off at about 85 miles per hour.

The boys named their plane "Baby Visalia."

TECHNICAL ADVICE TO ACETYLENE USERS

USERS of acetylene and various kinds of acetylene apparatus are often confronted with problems of installation, operation and maintenance which have been successfully handled by other users, but in some cases new problems arise which require experiment and consultation with engineers who specialize in acetylene subjects.

The International Acetylene Association, 30 East 42nd Street, New York, offers to all users the services of its Oxy-Acetylene Committee and its Technical Engineering Committee.

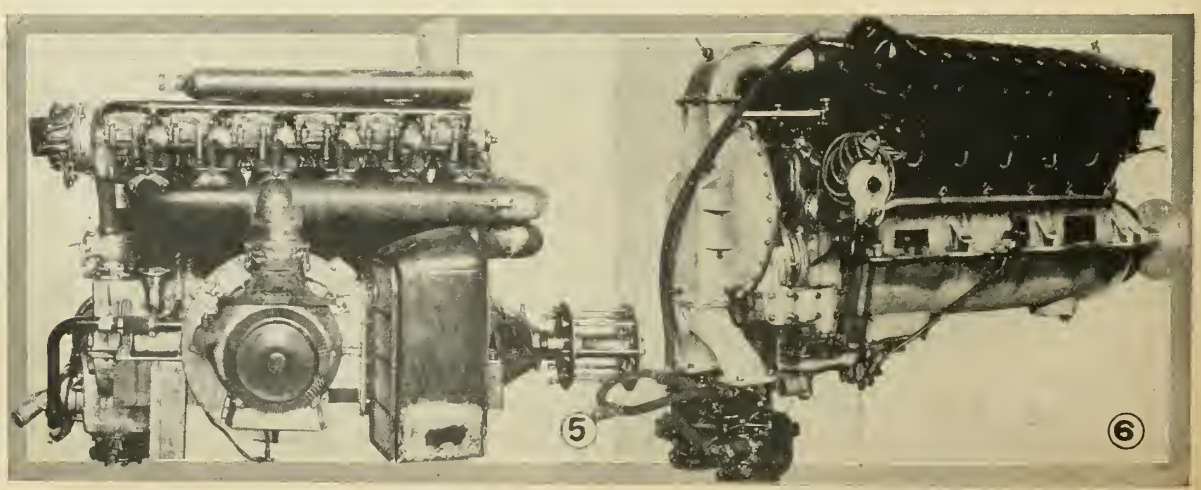


Fig. 5—pressure type system of supercharging on Liberty engine. Fig. 6—suction type system of Curtiss D-12.

Piling Up The Proof

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Mr. Walter Beech,
c/o Travel Air Mfg. Co.,
Wichita, Kansas.

June
2nd
1928.

Dear Sir:

We believe you will be interested in some facts about the unusual efficiency and satisfactory performance of the special Travel Air mail plane you delivered us about February 20th.

This plane you will remember made its maiden flight with Colonel Charles A. Lindbergh as pilot. Since that time in addition to special cross country trips this plane has had 370 hours in the air, and covered approximately 34,600 miles. The total motor time according to our log is 410 hours. In this period of operation we have not had a single forced landing, have maintained our schedules at 100% efficiency, and outside of periodical inspection and check have done nothing whatsoever to the motor except to make one change of spark plugs.

We consider this performance record a most unusual one.

Yours very truly,

H. H. Perkins,
Secy. & Treas.,
ROBERTSON AIRCRAFT CORPORATION.

U S AIR MAIL
CONTRACTORS

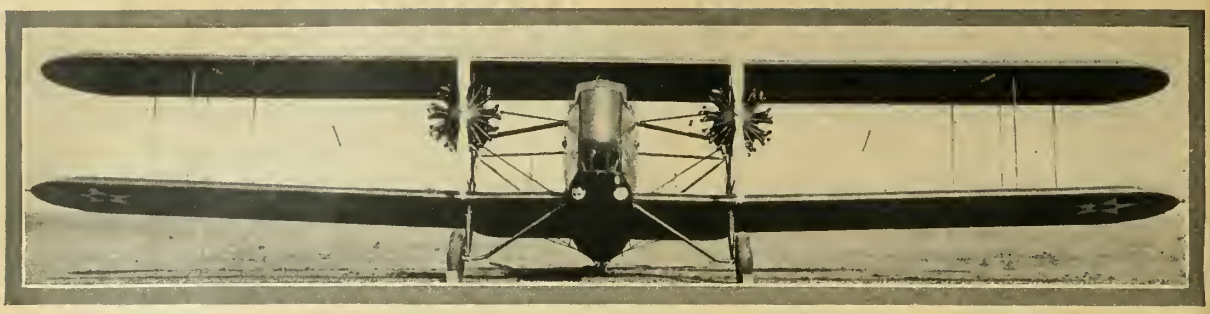


Story of Travel Air on request, including the new Cabin Monoplane Illustrated above—"The Limousine of the Air"

THE TRAVEL AIR MANUFACTURING CO.

WICHITA, KANSAS

"The Standard of Aircraft Comparison"



THE KEYSTONE "PANTHER" BOMBER

A CONTRACT for 35 giant Keystone "Panther" bombing planes costing approximately $1,300,000 was awarded by the U. S. Government to the Keystone Aircraft Corporation of Bristol, Pa.

The "Panther" is the latest development in bombers and was one of the five types designed according to Air Corps specifications and submitted to the Government by well known manufacturers.

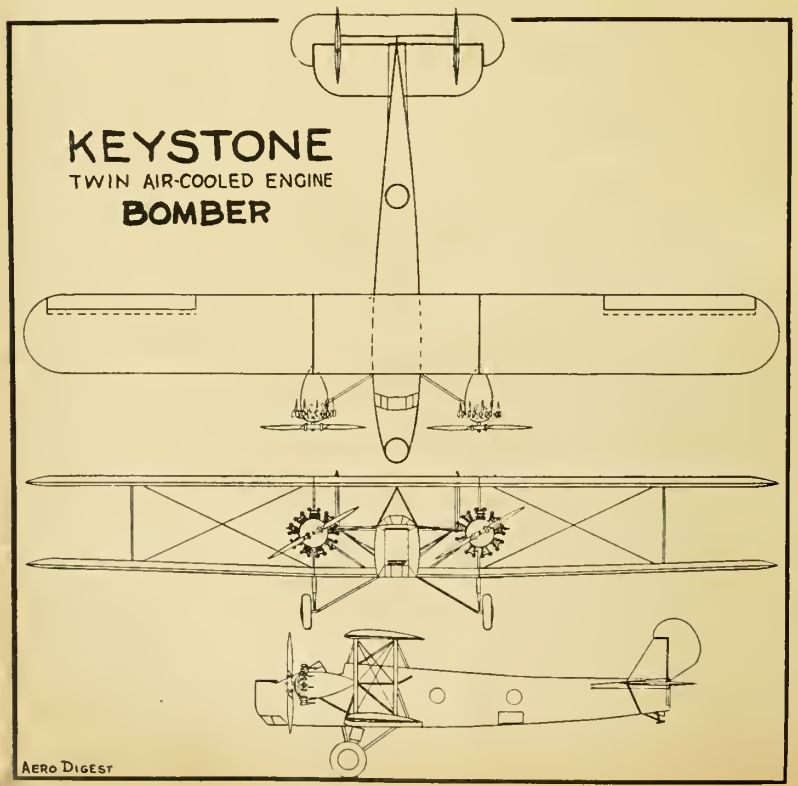
Manned by a crew of five, the "Panther" will be able to carry high powered explosives weighing more than 2,150 pounds. Standard bomb racks have been designed to carry a number of small bombs, two 1,100 pounders or a single giant weighing more than a ton. After the target is "spotted" by the bombardier, this one-ton bomb may be dropped by means of a simple ingenious release mechanism. A large engine mounted on either wing will generate over a thousand horsepower and give the "Panther" a speed of more than two-miles-a-minute. To protect the crew from enemy planes, the Keystone bomber will be equipped with five flexible machine guns, two in the nose of the plane, two in the rear and one firing through the bottom of the fuselage. These high powered machine guns will afford protection from every angle.

Approximately half of the engines required will be 525 h.p. Wright "Cyclone" engines. The remainder of the engines will be Pratt & Whitney "Hornets." An interesting comparison of these two famous types of air-cooled engines in actual service will be afforded.

Large tanks located in the upper wing of the plane are capable of holding enough gas to keep it in the air for more than six hours. The performance is said to exceed that of the present standard bombing planes by a considerable margin putting America's bombing equipment on a par with our pursuit and observation types.

The Keystone "Panther" is a biplane with a wing span of 75 feet and a total wing area of 1,140 square feet. It is 46 feet long and 16 feet high and weighs loaded nearly seven tons. It is compact in appearance on account of its clean cut lines. Fuselage, tail surfaces and lower wings, as far out as the motor mounts, are constructed of welded steel tubing, wood construction being employed in the upper and outer lower wing panels. A complete set of instruments provide for flying in all kinds of weather and Pioneer parachute flares and headlights enable the pilot to select a field and land at night.

On account of the reserve power and efficient design, the "Panther" leaves the ground after an extremely short run and can be landed in a small field. Experienced Army pilots have commented on the ease with which the big ship can be handled, the excellent visibility and the arrangement for the comfort and efficiency of the crew. The crew consists of a pilot and auxiliary pilot, either of which are trained bombardiers, one front gunner, one rear gunner and one radio operator.



LUNKENHEIMER ISSUES REFERENCE BOOK OF AIRCRAFT FITTINGS

THE principal types of Lunkenheimer aircraft fittings are conveniently listed for engineers and designers in a new booklet just issued by the Lunkenheimer Company of Cincinnati, Ohio. Many of the prints published are reproductions of original Air Corps Standard Sheets. They give dimensions and other engineering information of value.

Principal dimensions of Lunkenheimer commercial tubing unions and fittings are also given. Although not conforming to army requirements these particular fittings are suitable for the best commercial installations.

Information is given on the following items: shut-off cocks; drain cocks; union nuts; union nipples; union couplings; ell union primers. The following rough bronze pipe fittings: street elbows, plain elbows; 45 degree elbows; plain tees; plain crosses; couplings; close nipples; plugs; bushings. Commercial fittings include compression union fittings; S. A. E. standard flared tubing unions and soldering union fittings.



It Requires Less Effort to Fly A Waco than to Drive a Car

Dependable, high performance

Sturdy construction

Moderate price

The ability to get in and out of small fields

More Waco's are in commercial and pleasure service than any other make of aircraft

WACO AIRPLANES

The Advance Aircraft Co., Troy, Ohio

WESTERN NEWS

CALIFORNIA AIR RACES AND AERO EXPOSITION

THE eyes of the aeronautical world will be focused on Los Angeles September 8-16, inclusive, during the Aeronautical Exposition and the National Air Races. The Aeronautical Exposition will be an integral part of the National Air Races in Los Angeles during the full nine-day period of the meet. The general admission price of $1 will admit the spectator to both the races and the exposition. Exhibits will be open daily from 10 a. m. until 10 p. m.

The exposition grounds will be the terminus for the air derbies from New York City, Windsor, Canada; Mexico City, Mexico; Oakland and San Francisco. Also for the non-stop flight from New York City and for other events yet to be announced. All National Air Racing events will also be held on the closed exposition grounds.

More than two thousand entries have been received for the races. This figure does not include the scores of Army and Navy pilots who will enter the various competitions. Both these branches of the service have promised their whole-hearted support of the meet, and their entries are to come in later in a block.

Inquiries and actual reservations of space indicate that more than 400 manufacturers of aviation equipment will display their products in exhibits which will cover 200,000 square feet of floor space.

One of the most important divisions of the exposition will be the exhibits of airport equipment. With representatives of more than 5,000 airports expected to attend the affair, it is planned to call a meeting of airport managers in the hope that it may be possible to bring about a standardization of airport lighting, layout, etc. This move is endorsed by the Aeronautical Division of the Department of Commerce.

Cliff Henderson, managing director of the meet, from his headquarters at the Ambassador Hotel, Los Angeles, is helping formulate plans for several aviation conventions to be held in connection with the affair.

Mines Field, a 640-acre tract, is ideally situated for the meet. Within a wired enclosure the huge stands and exposition buildings are now under construction. In front of the stands three runways are being laid out, one for take-offs, one for landings, and a third for both take-offs and landings of guest planes. The pylons also are being erected, all within easy visibility of the grand stands.

The New York to Los Angeles non-stop race is attracting particular attention, requests for 355 entry blanks having been received.

Three elapsed time derbies from New York to Los Angeles, for as many classes of planes, with stops to be made at designated control cities, have attracted 610 inquiries.

The California state derbies, one from Oakland to Los Angeles and the other from San Francisco to this city, have been responsible for inquiries from 1,225 pilots.

The Pan-American derby from Mexico City to Los Angeles, a race limited to Mexican, Central American and South American pilots, has drawn 83 requests for entry blanks.

The International derby from Windsor, Canada, to Los Angeles, is attracting dominion-wide attention, requests for entry blanks having been received from 212 Canadian pilots.

The many important closed course races, to be run off around pylons within the confines of Mines Field during the period of the meet, have attracted 700 inquiries.

Transcontinental Air Race Route New York-Los Angeles

THE following routes and classifications for the transcontinental air derby from New York to Los Angeles have been announced by Kline Roberts of Columbus, Ohio, who is in charge of this feature of the 1928 National Air Races.

The cross-country flight will start from New York City on September 5 and is expected to take about five days.

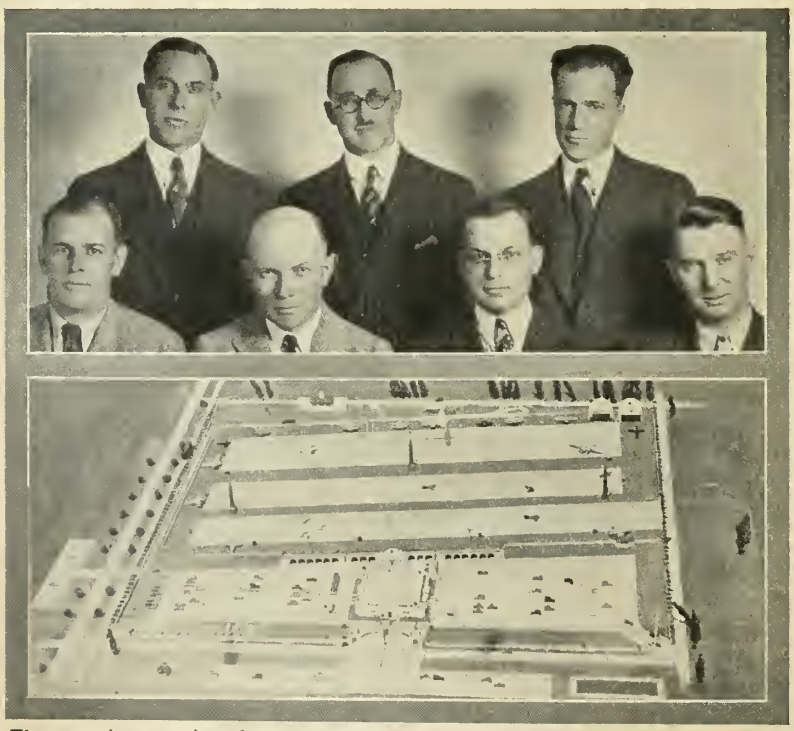
Contesting planes have been divided into three classes, each with a slightly different allotment of stop-over points and with different overnight stops. The arrangement is as follows:

Class A: Commercial stock planes with an engine of less than 510 cubic inch displacement and designed to carry one passenger besides the pilot. Route—New York, Harrisburg, McKeesport and Columbus, O. (overnight); Terre Haute, St. Louis, Kansas City (overnight); Wichita, Oklahoma City, Fort Worth (overnight); Abilene, Midland, Pecos and El Paso, Tex. (overnight); Lordsburg, Tucson and Yuma, Ariz. (overnight); Yuma to Los Angeles in one hop.

Class B: Standard commercial models with an engine of more than 510 but not exceeding 800 cubic inch displacement and each carrying a pilot and two passengers. The route follows: New York City, Harrisburg, Pa., McKeesport, Pa., Columbus, O., and Terre Haute, Ind. (overnight); St. Louis, Kansas City, Wichita, Kan., and Oklahoma City (overnight); a short hop in one day from Oklahoma City to Fort Worth where an overnight stop is planned; from Fort Worth the route is the same as Class A.

Class C: Single or multi-motored planes with more than 800 cubic inch displacement and carrying four passengers and a pilot. The route is the same as Class B, except that there are no 20-minute control stops at Harrisburg and Abilene, Tex.

Prizes for the three classes will total $40,000; $35,000 in class prizes and a $5,000 sweepstake prize.



The executive committee for the 1928 National Air Races and Aeronautical Exposition. Below, model of Mines Field, where the events will be held.

Rear row, left to right, D. E. McDaneld., sec'y-treas. California Air Race Assn., Theodore T. Hull, pres., Harry H. Wetzel, vice-pres. Front row, Dudley M. Steele, chairman contest committee, Dr. T. C. Young, chairman grounds committee, Robert J. Pritchard, chairman publicity committee, and Cliff Henderson, managing director of the meet.

PRUDDEN

ALL-METAL TRI-MOTOR



THE *public's* conception of *safety* should control your choice of passenger air transport equipment. Only tri-motored, all-metal planes command the real, active confidence of most people. Provide for that *big* market. The Prudden Air Transport assures patronage and profits to a maximum degree.

PRUDDEN-SAN DIEGO AIRPLANE CO.
SAN DIEGO, CALIF.

CONTACTS

By Frank E. Samuels

BOB BLAIR, manager of the Frank Baker Aircraft and Frank, himself, head of this fast growing concern, on returning from a trip from San Francisco, where they demonstrated the Buhl Airsedan over the northern territory, report a pleasant trip with very satisfactory results. Frank had just returned from the Buhl factory, ferrying the first of a fleet of five Airsedans, contracted for by the Ambassador Airlines, when the boys started on the northern trip.

Bob reports the soloing of their first lady student. Miss Bonnie Brown, who successfully passed the Department of Commerce examinations, received her license and is now a full fledged private pilot.

AERO CORP. of California is setting a good example to owners of other flying fields of Southern California. All of their instructors are not only licensed transport pilots, but are licensed airplane and engine mechanics as well. Due to the intense heat encountered while flying over the Arizona deserts, during the summer months, the Los Angeles-Phoenix-Tucson Air Line, has changed the schedule of the run until further notice, commencing June 13th. The ships by the new schedule leave Los Angeles, Mondays, Wednesdays and Fridays at 12:00 noon (Pacific time) arriving at Phoenix at 5:20 p. m. (Mountain time) and at Tucson at 7:00 p. m. Leaving Tucson at 7:00 a. m. (Mountain time) they arrive at Phoenix at 8:25 a. m. and at Los Angeles 12:00 noon (Pacific time) each Tuesday, Thursdays and Saturdays, making a tri-weekly round trip. Jack and Paul report ever increasing business, over the airline as well as at the flying field.

J. DON ALEXANDER, head of the company bearing his name and manufacturer of the Eaglerock airplane, is paying Los Angeles and the entire West Coast a visit. While here, he can be found at any hour of the day at one of our aviation engine manufacturers. He seems more than interested in both the Hallett and the Kinner motors. A wide-a-wake hustler of his stamp is not going to be caught with a shortage of motors for the big output of his airplanes.

WHILE on a recent visit to San Francisco, the first person we met when stepping out of the Maddux Line's Ford monoplane at Mills Field was our friend Charles V. Eakin, general manager of the West Coast Air Transport company, one of the big guns of the Pickwick Stage lines and best of all a prince of a good fellow. With him was Captain Devaney, chief pilot of the airline. Charlie could not say too much for the speedy and comfortable Bach Air Yachts that are flying the route, nor could he say enough for the big business the line is doing. So far it has been impossible to handle the large number of passengers desirous of making the trip both ways between Portland, Ore., and Seattle Wash., and the ships between San Francisco and Portland are flying full compliments of passengers each trip.

WHILE at San Francisco we called on Mr. Thaden, head of the Thaden All-Metal Aircraft Corp. The factory has all the earmarks of a coming big proposition. Their new ships were on the floor, in different stages of construction. The factory is equipped with the latest machinery and gigs for the construction of all-metal planes, and a full staff of engineers, mechanics and electricians are putting in full time perfecting these latest acquisitions of all-metal airplanes. Mr. Thaden expects to get on a production basis during the summer, when he will be able to give some encouragement to the many enquiring prospective buyers and agencies.

THE demand for aviation engines is becoming so great on the Coast, and I suppose that the same applies all over the country, that manufacturers of new motors are speeding up production in every way possible. While at Glendale, as usual we stopped in to see Mr. Kinner of the Kinner Airplane and Motor Company and were surprised to see the great piles of motor parts stacked up around the factory and under different stages of production. A lot of new machinery has been installed and a night shift of mechanics employed and the factory is now running to full capacity. Mr. Kinner informs us that with all their new facilities it is impossible for them to catch up with their back orders and the new orders coming in.

THE offices of the National Air Races are a busy place these days. A large corps of writers, stenographers, and the officers of the committee are working late into the night, sending out press matter, answering inquiries, signing up exhibitors for space and closing arrangements with contestants for the different events. The official program has not as yet been sent out, but the tentative program is being adhered to as close as possible. Los Angeles should be pretty well air-minded after the meet, which promises to be the biggest event the aviation industry has ever held.

TED WOOLSEY, head of the Thunderbird Aircraft, informs us that he has just taken an order for fifty Thunderbird planes from the Aero Club of Southern California, who have a contract for and are distributors of the plane for four states, Idaho, Nevada, Utah and Arizona. They have just taken delivery of the first two planes and are flying them from the Compton, Calif. Airport.

Frank B. Cochran, Reno, Nevada representative of H. C. Heidtman, Buick distributor for the state of Nevada, on June 16th took delivery of one of the nicest equipped light planes we have seen, Thunderbird Model W 14 equipped with a 180 h.p. Hispano. The plane is equipped with wheel brakes, compass, airspeed indicator and many other extras and finishing touches. It is to be used for business purposes, visiting his 20 dealers throughout the state and for business trips, between Reno and San Francisco.

ANOTHER new airport and flying school has been added to the long list of commercial airports that the aviation industry of the Coast is so justly proud of, the Eagle Airport, situated on Ventura Blvd. just beyond Studio City, North Hollywood. The field is managed by Donald Scoles, Southern California and Arizona distributor for the American Eagle Aircraft Corp. The flying school uses only American Eagle planes and have a course of instruction, strictly standardized.

ANOTHER flying school that is coming to the front is the O'Donnell School of Aviation at the Long Beach Municipal Airport, Long Beach, Calif. Mr. O'Donnell gives his students practical experience in all branches.

The Long Beach Airport, by the way, is now one of the finest flying fields in this country. The field has been enlarged to more than double its original size, has been levelled until it is like a floor, has a four-way runway, a number of new hangars and everything necessary for comfort and safety.

The Navy reserves are quartered there now. They have their own section of the field, a beautiful headquarters building and club house and the latest improved hangars for their training ships.

C. C. MAIDMENT, factory representative of the Wright Aeronautical Corp., is leaving for Australia to check over the Wright engines on the *Southern Cross*. He is associated with the Pacific Aeromotive Corporation and superintended the overhauling of the engines for the Pacific flight.

According to W. E. (Tommy) Thomas, general manager of the Pacific Aeromotive Corporation, "Before the *Southern Cross* started its flight to Australia it had been used in three attempts to establish a new endurance record and came within a couple of hours of doing it. The engines had run 175 hours, which is equivalent to 20,000 miles, and they needed an overhauling before the big flight.

"We did the work in about two weeks' time, and when we had finished the motors were practically as good as new. They were in such good shape that only about $50 worth of parts had to be replaced. Smith was so pleased with the engine's performance that he cabled to send a man to Australia to see that the engines were in first-class condition for the next trip, and Maidment is going at once."

CLOVER FIELD, Santa Monica, is undergoing a thorough renovation. The city of Santa Monica have a large force of laborers with the latest machinery, levelling the entire field. The new Douglas plant is well under way, all of the old hangars are to come down and new ones built and in fact everything done to make it a strictly high class municipal airport.

Speaking of the Douglas Company, we made a trip through the old plant this week, and were surprised to see the great amount of activity. Over six hundred persons are employed there and it is surely some busy place. We would be afraid to say how many ships were under different stages of construction, or what their weekly output is, but they must be tremendous. And what a system—no confusion, everything like clock work and everyone interested in their work.

D O U G L A S

F I R S T A R O U N D T H E W O R L D



Standing firmly behind the fact that Douglas builds airplanes of exceptional dependability is the equally important fact—Douglas Develops Men!

THIS is the Douglas contention—"The performance of an airplane is equal only to the industrial performance of the men who built it; therefore commensurate with the quality of the Douglas plane must be the craftsmanship of each individual man charged with its construction."

Six hundred master craftsmen are employed in the Douglas Shops. No matter what his position may be—whether he be foreman, master mechanic or craftsman—Douglas firmly implants in his consciousness that he, on the job he is doing, is the key man in the construction of Douglas aircraft; that squarely upon him rests the success of each plane.

Back of him, constantly at his command, are the tremendous resources of the institution that is Douglas. The cumulative knowledge in the construction of aircraft secured by this company thru its years of experience, is his. Thus through the development of the human element Douglas again emphasizes, through the highest standards in aircraft construction, the fact that—Douglas Means Dependability.

T H E D O U G L A S C O M P A N Y

Santa Monica *California*

CALIFORNIA AIR NEWS

W. E. LA FOLLETTE has been engaged by Maddux Air Lines, Inc., to take the post of general superintendent. He will have complete charge, under J. L. Maddux, president, of all operations, maintenance and field activities.

The present route of Maddux Air Lines from San Diego to Los Angeles, Bakersfield, Fresno and Oakland soon will be extended to cities of the southwest.

THE Universal Institute of Aeronautics, Inc., successors to the Universal School of Aeronautics, has moved the administrative offices and lecture rooms to 1770 North Vermont Avenue, Hollywood, Calif.

Added facilities are now available to extend the excellent work carried on in the past by the Universal School of Aeronautics.

The faculty has been enlarged, and both the home extension and lecture courses have been rearranged and the latest developments in aeronautical science have been incorporated. The studies of all the students come under the personal direction of Captain T. Cameron Wilkinson, the president of the Institute.

ON the night run from Los Angeles to Oakland, carrying the *Los Angeles Times*, the Mutual Aircraft Corporation's Ryan Brougham has kept within 15 minutes of arrival schedule, according to M. B. Rapp, president of the Mutual Aircraft Corp.

THE first all-metal trimotored monoplane manufactured on the Pacific coast has been delivered by the Prudden-San Diego Airplane Company to F. W. Hemingway, president of Beacon Airways of California and Beacon Airways of America.

An unusual feature of the new plane is the low-hung outboard motors. The plane has a wing spread of 57 feet and is powered with three Ryan-Siemens engines. It carries six passengers and two pilots.

SACRAMENTO NOTES

By E. J. Carnes

A SUCCESS from both financial and attendance standpoint, Sacramento's first annual aircraft show closed May 27 after three days of thrills that were watched by approximately 40,000 spectators from Sacramento and the valley cities.

Starting with a race for OX5 planes from Mills Field, San Francisco, which was won by "Red" Williams in an International F-17, the show went smoothly through a program of races, stunt flying, parachute jumps and other exhibitions.

On the second day a race from Oakland airport to Sacramento was won by "Sandy" Sanders in a Lincoln-Page.

A 100-mile free-for-all race on the closing day was won by Lieut. T. J. Cushman of the Marine Corps in a Curtiss-Falcon, who covered the distance in 59 minutes 20 seconds, followed closely by Capt. H. D. Campbell in another Falcon.

Leo Moore in his Travel Air won the finals in the dead stick landings and was awarded the Sacramento Aviation Club trophy.

An aerial wedding ceremony was performed 3,000 feet over the state capitol grounds in a Breese cabin plane piloted by "Andy" Andrews. The principals were Miss Rose Churchill of Sacramento and John Charles Gregory of Dayton, Ohio. Justice of the Peace H. P. Andrews, father of the pilot, was the master of ceremonies.

The main hangar and a large tent were used to house exhibits by a number of aircraft manufacturers and other branches of the industry. The Standard Oil company of California had a small working model of their big "S-D" beacon near San Francisco.

The Galt Union High School's aviation department had an Eaglerock plane and a display of parts, instruments and accessories.

Sydney's Aviation Service of San Francisco showed Resistal goggles and Fonda helmets.

General Electric Company and the B. B. T. Corporation had a display of lighting equipment.

Consolidated Instrument company was well represented, and the Boeing Air Transport had a snappy little model of their mail plane in a prominent corner.

Sam Purcell, flying his beloved old Curtiss "R", with a 180 B.M.W. motor, galloped gaily in on the boys from his headquarters at Redwood City, and did a good business carrying the air fans over the city.

Ingvald Fagerskog and Don Pruett completed a little one-man biplane in time for the show. The bus is powered with an old style Anzani six-cylinder 40 h. p.

CAPITAL AIR LINES, INC., has been organized by a group of local business men.

Breese cabin monoplanes, with Whirlwind motors, will be used for a passenger service twice daily between Sacramento and Alameda, across the bay from San Francisco. Four of the planes have been ordered from the Vance Breese company, and will be put into service as deliveries are made. Extension of the route to Chico and Redding on the north is planned, also later extensions to Lake Tahoe, Yosemite Valley and Del Monte.

The Capital Air Lines will take over the business now conducted by the A. N. M. company at the municipal field. In addition to the regular service and resort service, the company will conduct a flying school and do short passenger carrying work. Royal Miller is president of the organization.

SAN FRANCISCO BAY

By H. Kitson

WITH the construction of an airdrome to rival Croydon in London and Le Bourget in Paris, as its main project, the San Francisco Bay Airdrome, Inc., has recently received favorable action on its application for incorporation papers.

The company plans to use filled-in marsh land owned by the University of California and announces that a satisfactory lease can be arranged with the regents of that institution. The land has been used by several fliers as a landing field, including Walter Varney who holds the air mail contract between Salt Lake and Pasco, Washington. It is proposed to spend between $100,000 and $150,000 on improvements putting the field in the AAA class.

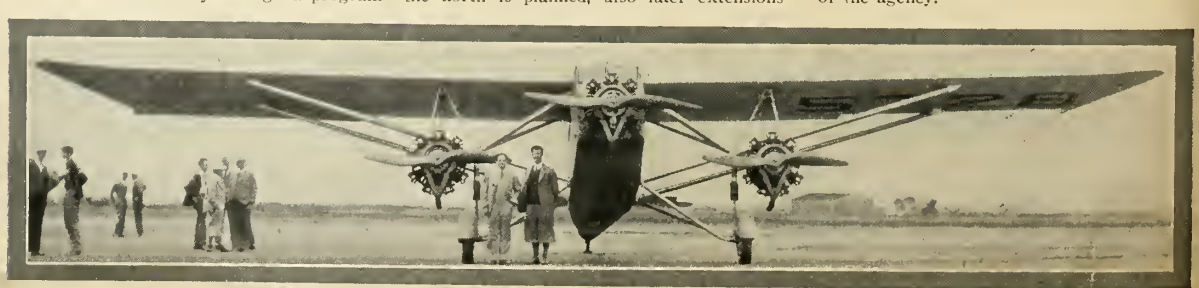
The site is located in Alameda, adjacent to Oakland. It is easily accessible to Oakland and San Francisco, enjoying rapid transportation to both cities.

BREAKING all previous records in its wonderful growth, Oakland Airport records show a total of 7,483 landings, 4,810 passengers carried and earnings of $2,729.25.

Three concrete warming up platforms are under construction at the Oakland Airport. The platforms are built on the taxiing runway so that a plane can be rolled out on the runway and its propeller placed over one of these platforms, thus preventing dust and dirt being stirred up by the propeller action. The platforms are 8 feet by 8 feet by 4 feet.

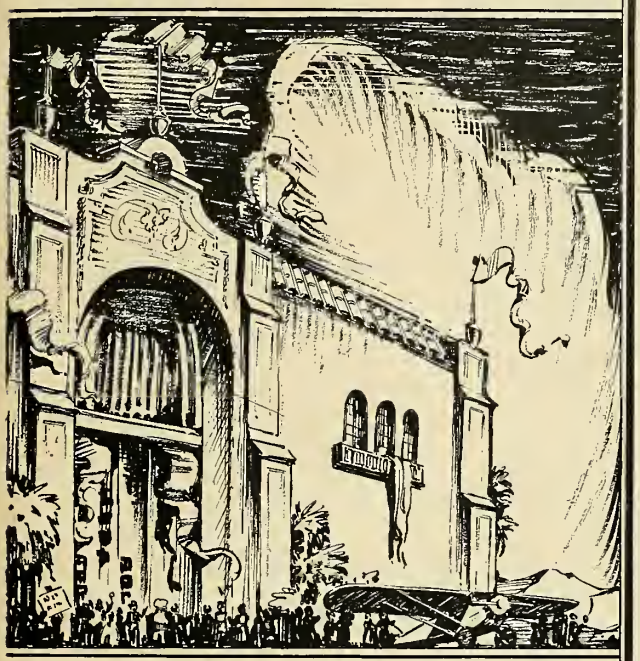
THE newest addition to Oakland's aircraft industries, the Sierra Aircraft Company, has filed articles of incorporation. The headquarters of the company will be located at the Oakland Airport, and the concern will take over the sub-contract for Eaglerock planes in California, Albert Hastings being in charge of the distributing agency.

THE Golden State Aircraft Company, former distributors of Eaglerock planes for northern California, has taken over the northern California agency for Lincoln-Page planes. James L. Mayberry is head of the agency.



The first Prudden all-metal trimotored transport manufactured on the Pacific Coast. It has three Ryan-Siemens engines.

1928 National Air Races *and* Aeronautical Exposition



Los Angeles
September 8th to 16th

An Important Message to Aircraft Manufacturers

ONE Million Five Hundred Thousand air-minded people, residents of the most air-conscious section in America, will visit the 1928 National Air Races and *Aeronautical Exposition*.

Every distributor and aircraft dealer of importance in the United States, as well as pilots from this country, Canada and Mexico will be in attendance making this the most vitally important aviation event of the year . . . *to you!*

Manufacturers of aircraft, exhibiting their products in this mammoth exposition, place them at one sweep before the *largest buying market* ever gathered together in the field of aviation.

Manufacturers meeting distributers, dealers and *prospects* on common ground will emerge from this major event with their 1929 production contracted for or sold!

A beautiful, especially constructed exposition building of Spanish design, containing two hundred thousand square feet of space, will provide a brilliant setting. The exposition building will be situated directly on Mines Field . . . the site of the air races! The paramount importance of the exposition building's location on the actual site of the air-meet finds emphasis in the fact exhibitors will actually be able to fly their planes from factory to their exhibit space without the expense of dismantling the plane, trucking it thru traffic-congested streets and re-assembling it again in the show. Spacious doors, wide enough to permit any plane to roll right from the flying field into the building will be provided.

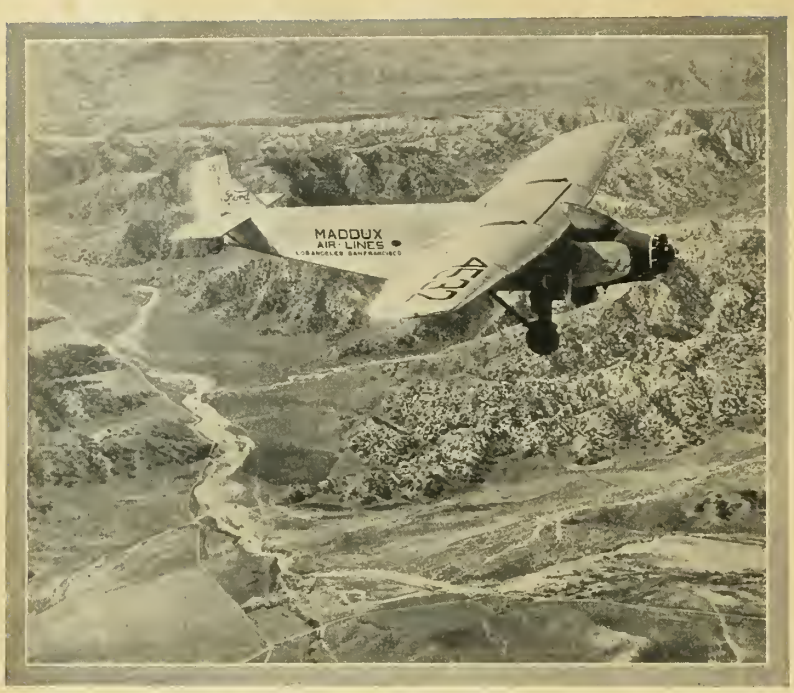
Space for this exposition is priced extremely low. The 1928 National Air Races and Aeronautical Exposition is conducted on a non-profit basis. Exhibit *your plane* before this vast assembly . . potential purchasers of aircraft. Your request for information concerning available space and rates will receive a prompt and courteous answer.

California Air Race Association

CLIFF HENDERSON, *Director*

Ambassador Hotel . . Los Angeles





Ford tri-motor flying over the Maddux Air Line route.

A SCENIC AIR TRIP

By Frank E. Samuels

OF all the beautiful scenic air tours in California we believe that the four hundred mile Los Angeles-San Francisco trip, in one of the comfortable and safe three-motored cabin planes flying on regular daily schedule between the two cities, is the most delightful.

On June 4th at 9:30 a. m. we, with nine other passengers, boarded the Ford all-metal plane of the Maddux Airlines at Rogers Airport, and with Johnny Guglielmetti, that prince of pilots, at the controls made a perfect take-off.

The passenger list for the trip included: Henry Hoey, San Francisco Traffic Manager, Boeing Air Transport, Inc.; Ray F. Hussman, Representative Crabtree's Travel Office, Oakland, Calif.; Harold H. Sweetser, San Francisco *Examiner*, and Mrs. Sweetser; Mr. and Mrs. H. L. Whuston of Los Angeles; W. P. Callahan, San Francisco; M. J. Flynn, Los Angeles; J. B. Miller, San Francisco, and "yours truly."

We flew over Hollywood, with its beautiful homes and gardens and were soon crossing the Hollywood mountains. On our left was Lake Hollywood and on our right Silver Lake, with Mulholland drive, the great scenic boulevard, winding along atop the ridges, directly under us. Flying the length of San Fernando Valley, passing over Glendale, Van Nuys and San Fernando and the beautiful outlying garden truck-farms, we passed over the town of Saugus at the head of the valley and foot of the Sierra Nevada range, with the big lake-like reservoir that furnishes Los Angeles with its drinking water, on our left; then across the Santa Clara valley, scene of the late St. Francis dam disaster, where so many lives were lost.

By this time we had an altitude of nine thousand feet and were looking down on the rugged peaks of the timbered Tehaschepis range of mountains with its deep ravines and towering peaks, snow-covered all the year. A little further and we passed directly over Lake Lebec and the beautiful summer hotel, nestling amidst a clump of trees in a pretty ravine. On our right far down below the mountains was Antelope Valley and a little further beyond was the great Mohave Desert.

Having flown over the highest point of the entire route, we started to descend over the San Joaquin Valley, with Buena Vista lake on our left and the state highway directly under us. This we practically followed to Bakersfield, where we made a perfect landing at our first point of call, one hour and five minutes from the start and fifteen minutes ahead of schedule. Two passengers disembarked here and two others took their places.

"All aboard" and off again over the highway for fifty-five minutes—over beautiful farms on both sides, with occasionally a strip of alkali country, and over a number of small towns until we dropped down into Fresno, just two hours from the start, and where lunch was waiting for us. Three passengers left us here and we took on two.

A little longer run was necessary to take off here on account of the dead hot air, then a direct airline for a pass in the Santa Clara coast range of mountains. Over farms, cattle ranges and at times along a little winding river. Then over as rugged a range of mountains as we had been over during the trip and we dropped down quickly from an altitude of six thousand feet onto the Oakland Municipal Airport.

We stopped just long enough for two of our passengers to disembark and again took the air for a ten-minute flight over San Francisco bay and landed at Mills Field, San Francisco's municipal airport, at 1:45 p.m.—four hundred miles, three stops, one for lunch, in exactly four hours and ten minutes.

On my return trip, two days later, we had just such another trip. Clear as a bell, air as smooth as glass and a full compliment of passengers. We had the pleasure of having with us Mr. Milo Kent, supervisor of San Francisco County and chairman of that body's Municipal Airport Commission, and his young bride, who were making their wedding trip via airplane. For pilot on the return trip we had that veteran pilot, George Allen.

LOS ANGELES METROPOLITAN AIRPORT

THE Los Angeles Metropolitan Airport has been established to fill the long felt need of the aircraft industry of Southern California for permanent locations. It is located in the San Fernando Valley and is close to the center of the origin of the Los Angeles air passenger travel.

Certain areas of the airport are designated as sites for the erection of factories, hangars, and aircraft industries. The balance of the airport area is designated as runway systems and streets leading to the runway system. The sites have been laid out in various sizes to suit practically every phase of the aircraft industry. The runway systems will be owned and controlled by an operating corporation, all stock in which will be held by those that are actually owners or tenants of the airport. This will vest the ownership, management and maintenance of the runway systems with those that are actually using the airport.

The runways are to be leveled, surfaced, and drained where necessary, and an administration building erected and provision made for a radio station and weather bureau in time for occupancy, October 1st.

The plan has been evolved with the idea of giving the aircraft industry a permanent base at an expense heretofore impossible by the concentration of many operators and manufacturers in one place.

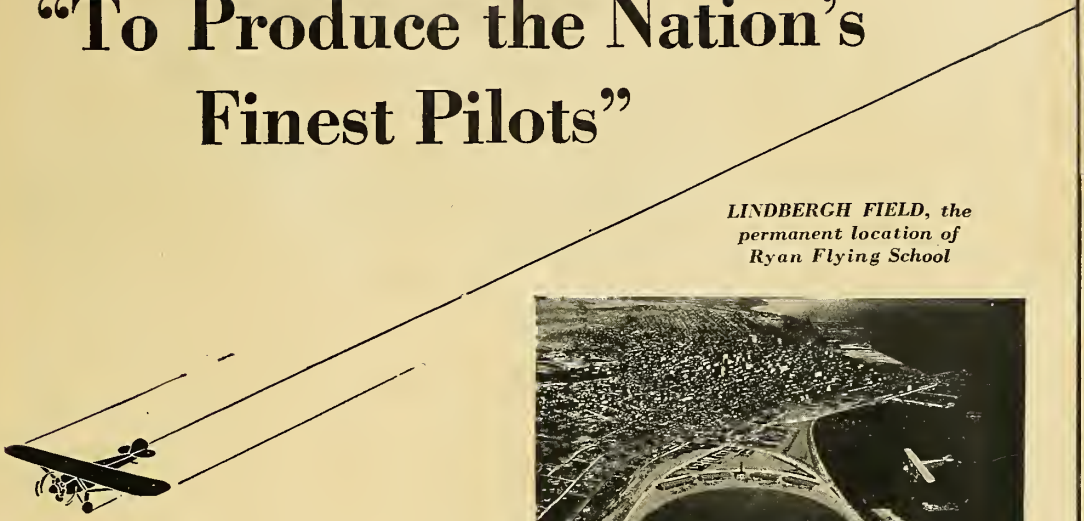
The project, at present, is under the management of Waldo D. Waterman, veteran air pilot and aeronautical engineer. Future management of the L. A. Metropolitan Airport will be determined by the Board of Directors of the operating corporation, which will be controlled by those operating on the field.

COLORADO AIR NEWS

"AIR MAIL WEEK in COLORADO" May 14 to 21st was a big success. Frank L. Dodge, Postmaster of Denver, said the outgoing mail during air mail week was the heaviest of any week since the air mail service was started in Colorado.

Civic organizations, service clubs and other organizations, joined in the campaign to put it over. The Tramway Company had large placards on the front of every street car in red, white and blue. The Denver Tourist Bureau issued a special folder and the Western Air Express, Inc., furnished souvenir air mail envelopes free to all organizations who placed copies of each at the plate of every member during air mail week luncheons.

"To Produce the Nation's Finest Pilots"



LINDBERGH FIELD, the permanent location of Ryan Flying School

RYAN Under the personal supervision of T. C. Ryan, the Ryan Flying School becomes America's first & foremost University of the air.

¶ Affiliated with the Pacific Technical University, every educational element has been welded and focused on achieving the Ryan Ideal "To Produce the Nation's Finest Pilots."

¶ Located in San Diego, "The Air Capital of the West," the student works in an atmosphere of aviation; he associates with air-minded men. His is the opportunity of observing all types of planes in the air under control of seasoned pilots from the huge United States Government Military bases close to the school.

¶ Headed by Mr. Ryan, a staff of capable teachers and experienced pilots are at the student's command. Planes and flying equipment of the most modern, advanced design are here available for student instruction. The entire school is conducted in strict conformance to the rigid regulations of the United States Department of Commerce.

¶ There are no idle hours at the Ryan Flying School. Mornings are devoted exclusively to thorough ground work instruction; the afternoons to intensive flight study and training. Efficiency in education is the standard.

¶ Complete information is now available for those desiring the highest character of aviation instruction. The coupon below, filled out and mailed to the RYAN FLYING SCHOOL at San Diego, California, will bring the complete story.

MAIL THE COUPON IMMEDIATELY

RYAN Flying SCHOOL

413 Union Building San Diego, Calif.

RYAN FLYING SCHOOL, San Diego, California
I am interested in your course of Flying Instruction. Please send full particulars.

Name_____ Address_____

SAN FRANCISCO BAY

THE California Institute of Technology at Pasadena will offer a special graduate course in aeronautics during the academic year 1928-1929. The course will be conducted by visiting Professor Theodor von Karman, professor of mechanics and aerodynamics and director of the aerodynamical institute at Aachen, in association with the following professors of the Institute staff: Robert A. Millikan, Harry Bateman, Eric Temple Bell, Paul Sophus Epstein and Richard Chace Tolman.

ANOTHER completely equipped aeronautical school has been opened at San Francisco. It is known as the Summit Aircraft Company Aeronautical School and has headquarters and ground school at 1439 Van Ness Avenue.

The school's hangars are at Mills Field, a JN4D, a Hisso Jenny, and two International F-17 ships being used for instruction. "Red" Williams is chief instructor.

Navigation will be taught by Emory Bronte, navigator of Ernie Smith's Oakland-Honolulu plane, the first civilian plane to make the transpacific flight. Instruments and aerology will be taught by Capt. Roy Francis, formerly commandant at Kelly Field. Richard Burtz will teach radio and motors will fall under the care of "Red" Williams. There will be three additional transport pilots for student flying instruction.

HONOLULU AIR NEWS

By Verne Hinkley

COLONEL ARTHUR C. GOEBEL, winner of the Dole Derby from Oakland to Wheeler Field last year, was in Honolulu for two weeks during the latter part of May after a 46-day good-will air tour of Japan.

He brought back with him several very definite impressions of the status of aviation in the land of the rising sun.

First of all he found, in his tour of the country, that the Japanese public is highly skeptical of flying. It is hard, he learned, to induce civilians to ride in planes, due to a fear of the air brought about, no doubt, by the many fatal crashes which have marked the history of aviation in the Oriental nation.

To offset this state of affairs the government is taking steps to breed a generation of children who are far more air-minded than are the younger men and women of today. School pupils are being taken on regularly constituted trips to army airdromes where they are given every opportunity to inspect planes, motors and hangars, and in addition are given complete explanations of the operation of modern aircraft.



One of the Fokker transports of the Western Air Express Line.

Colonel Goebel found that aviation officers of the Japanese army are keen fliers and that they compare very favorably with American military pilots. He commented, however, on the fact that he noted very little, if any, aerobatics, during the time that he was visiting Nippon flying fields.

Colonel Goebel commented further on the aviation fields of Japan which he classified as among the very best it has ever been his privilege to see.

PROSPECTS for a capably financed and properly equipped Hawaiian airway connecting the various islands, increased materially with the recent announcement that the Inter-Island Steam Navigation Co., a firm in business here for the last 30 years, has entered into negotiations with the Boeing company, of Seattle.

A Boeing representative will come to Honolulu in the immediate future to make a survey. If he recommends the establishment of the line the Inter-Island, according to an announcement by Stanley C. Kennedy, assistant manager, is prepared to invest immediately in the necessary equipment and inaugurate the service, augmenting its steamship schedules.

Mr. Kennedy, during the World War, was a naval aviator and is in a position to superintend the new air line as an expert. It is understood that the Boeing company will have an interest in the new venture.

A second group of Honolulu business men, it is reliably reported, is dickering with another west coast air transport company with a view to establishing a similar connection on which to base an air line between the islands.

THE search for the Golden Eagle, lost Dole Derby plane piloted by Jack Frost and navigated by Gordon Scott, has been started on the island of Hawaii, by Danham Scott, brother of the missing man. He came to Honolulu during May and obtained the services of Martin Jensen, winner of second place in the Dole flight, and the *Aloha*, the plane Jensen flew. The two have gone to the Big Island where a careful search, lasting perhaps for months, will be carried out, both from the air and by foot and horseback.

The quest is based on reiterated reports from Big Island residents that on the day of the finish of the Dole flight a plane said to closely resemble that flown by Frost was seen over the city of Hilo in the early afternoon. It is believed that should the ship have been the Golden Eagle, it crashed in clouds against one of Hawaii's 14,000 foot mountains, both passengers perishing.

A portion of the jungle in the Puna section of the island already has been investigated without result. The searchers are now turning their attention to the peaks of Mauna Kea and Mauna Loa.

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MOTOR PARTS AND SUPPLIES

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AIRPLANE PRODUCTS



REV'S FOR OX5's
By LESLIE C. MILLER
A book explaining all faults of the OX-5 Curtiss motor and the remedy for each fault. How to get more horsepower, efficiency, reliability and economy out of this type motor. The author has over 3500 flying hours experience with the OX-5.
PRICE ONE DOLLAR

Dealers Wanted

MILLER'S POSITIVE INTAKE VALVE CONTROL FOR OX'S

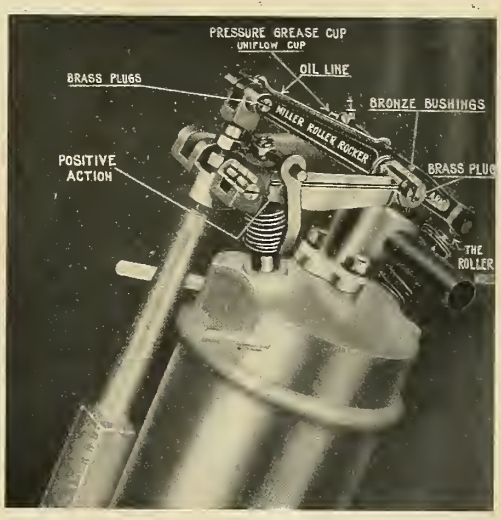
Saves 15% on gas, adds 20 to 50 rev's to the motor speed, takes all noise from the overhead, greatly reduces friction in pins, bearing surfaces, valve guide and pull rod. Over one thousand sets now in use on OX's in planes, speed boats and racing cars. Standard equipment on Alexander Eaglerocks and now being adopted by other leading manufacturers.

PRICE per set of eight $10

MILLER'S ROLLER ROCKER ARM

Preventing wear on exhaust valve guides and seats, doubles the life of the OX cylinder. The roller rolls freely across the valve stem end, instead of sticking and exerting a tremendous side pressure on the guide and valve seat as is the case with the former tappet. More power longer sustained.

PRICE $15
Per Set of Eight



THE NEW MILLER OVERHEAD

The large pins operate on Bronze Bushings, all four pins are oiled under constant pressure from Cincinnati Ball-crank uniflow lubricators.

The system is guaranteed to give twice the service of former OX overheads. It is impossible for the pins to lose out or for grit to get into any of the bearing surfaces.

Miller Roller Rocker Arms and intake valve controls are included in the Miller Overhead.

With push and pull rods	$90.00
Price as illustrated, per set of eight, less push and pull rods	85.00
With alemite connections, but less Cincinnati Ball-Crank Lubricators; with rods	78.00
Without rods	73.00

THE MILLER VALVE GUIDE REMOVING AND REPLACEMENT TOOL SET

Is a complete equipment for removing and replacing valve guides in old cylinders; all operations are by hand, no machinery necessary. Ninety-nine out of a hundred used cylinders can be put back in the service with this set.

Ream out the old valve seat and use oversize head valves.

Valve guide tool set	$35.00
Grey iron guides	.65
Valve seat Reamer set, all necessary reamers	22.50

Write for pamphlet fully describing all Miller Products

MILLER AIRPLANE PRODUCTS ARE SOLD ON 30 DAYS' TRIAL. MONEY REFUNDED ON ANY UNSATISFACTORY PURCHASES

MILLER AIRPLANE PRODUCTS

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Terms 5% discount for cash with order. 10% deposit required on all orders. Write your supply house or order direct.

NORTHWEST AIR NEWS

By F. K. Haskell

YAKIMA'S airport was officially dedicated on June 2nd in the presence of some 10,000 persons from all portions of the Inland Empire. Guest fliers included the party in the Fokker plane making the National Air Tour pathfinding trip headed by Lieut. Peter E. Skause, pilot; Carl H. Keller, Frank Bogart of the *Detroit Times;* James V. Piersol, *Detroit News;* Hugh White, *Detroit Free Press;* Lieut. George Schulgren, Wright Field; Staff Sergeant John Carden and Ray Cooper.

The 20-mile race at the airport was won by Tex Rankin in 11 minutes 40 seconds; C. L. Scott, Seattle, second, 12 minutes 4 seconds; Edward Bigelow, Spokane, third, 12 minutes 14 seconds.

Lieut. Jack Rose of Spokane won the air race from Spokane to Yakima.

Tex Rankin won the air race from Portland to Yakima in 1 hour 23 minutes.

C. L. Scott won the Seattle to Yakima race in 1 hour 3½ minutes.

Art McKenzie in the Portland race was forced down at Warrensdale, making a skillful landing in a plowed field. A. W. Davis was also forced down near Goldendale and Gordon E. Mounce had to land in a field near Union Gap; no casualities.

E. B. Riley, Yakima county commissioner, presided at the dedication exercises.

YAKIMA, WASH., and Portland, Ore. exchanged ambassadors of good will on June 2nd when Tex Rankin's daily airplane service was inaugurated between these two airports.

The first plane that took off from the Port of Portland carried, in addition to several huge bundles of the Portland *Oregonian,* Frank L. Shull, president of the Portland Chamber of Commerce, Commissioner Bigelow, Kenneth S. Jordon and Mrs. Margaret Porter of Oswego, Ore., 69 years of age and one of Yakima's early residents. Frank Anderline was at the controls of the Waco.

Mayor W. B. Dudley of Yakima arrived in Portland on the first southbound plane. With him was W. W. Caldwell of the Yakima Police Department. Arthur Walters piloted the plane.

WHITNEY CLOSE of Spokane, in his Swallow airplane, won the Spokane-Walla Walla air derby on May 27th in 1 hour 30 minutes 1 second. Five machines participated and 5 minutes 19 seconds covered the spread between the first and the last to arrive.

Maurice McMeahan, Yakima, came in second in his Eaglerock, doing it in 1:32. E. C. Bigelow, Spokane, in his Eaglerock, was third with 1:32:9. Penn Stohr, Plains, Mont., in a Swallow was one second longer than Bigelow on the trip, his time being 1:32:10. Lieut. Jack Rose, Spokane, in a Waco, was fifth in 1:35:20.

The air rained airplanes for a time as the Spokane men began dropping in. Close got away at 8:31 and dropped at 10:02. McMeahan left Spokane at 8:34; Bigelow at 8:33; Stohr at 8:30 and Rose at 8:36.

Tex Rankin, Portland, won the Portland-Walla Walla air race, making the trip in 1:03:45.

John Langdon, piloting a plane from Everett, Wash., arrived after a trip through the Snoqualmie Pass in the Cascade Mountains in 3 hours and 15 minutes.

Perfect weather greeted the throngs who enjoyed a two-day air circus here in dedication of Walla Walla's new air field. The formal dedication was made by Brig. General Paul H. Wayrauch, of Spokane.

A. T. SHERE of the Oregon Eaglerock Sales Company has established an air field near upper Klamath Lake, from which he will operate both sea and land planes, and make frequent trips to Crater Lake and Diamond Lake.

Mr. Shere will be assisted by Frank Krammer of Portland who will also take an active part in an aviation school, which will be the only one located in this far western country.

AT the meeting of the Washington Airport Association held in Walla Walla, Wash., it was decided that aviators on barnstorming trips would hereafter be required to contribute 10 to 15 per cent of their receipts to the airports for development work; and also that all pilots should be forced to pass an examination.

THE airline distance from Fairbanks, Alaska to Walker Lake at the head waters of the Kobuk and Noatak Rivers is 325 miles. C. F. Crawford, Alaskan pilot now in Seattle to purchase a new plane, carried seven prospectors and their season's supplies to their isolated but rich placer country just before he came "outside."

It required fifteen trips to get the seven miners and their supplies to Walker Lake, but Crawford completed the job in ten days and had no forced landings.

It would have taken the prospectors six weeks to have mushed the distance, and they would have consumed all their supplies getting there.

LIEUTS. Harry R. Wilson and Ancell C. Eckmann, both veteran army fliers, have become associated with the Seattle Airways, Inc., as pilots and instructors, according to Z. F. Ballantyne, secretary-treasurer and manager of the company. R. H. Aikin has joined the company as chief mechanic and rigger.

L. H. McHENRY, will pilot the Coast Air Lines, Inc. new International cabin plane on the Seattle-Grays Harbor service and also on the Seattle-Vancouver, B. C. run.

Exporting Service

ROBINSON, McLEAN AND COMPANY, exporters and importers of Seattle, have created a special department for the handling of airplane accessories for exporting to countries bordering on the Pacific ocean.

R. D. Robinson is president of company. He has spent the last seven years in the Orient, Far East and New Zealand and Australia making a study of marketing conditions for U. S. products.

The firm will act as purchasing agents for their various overseas connections.

Portland Air Carnival

UPWARDS of 5,000 people braved the inclement weather to witness the big air carnival on Swan Island, Portland, Ore., June 10, which was sponsored and successfully carried out by the Aero Club of Oregon.

Arrival of the huge three-motored Ford-Stout plane and the first three ships in the Camp Lewis-Portland race was simultaneous, and was a fitting open of the air circus.

With a flying time of 1:03, C. L. Scott, flying for the Seattle Flying Service, landed his Travel Air for first place in the race. A scant quarter minute had passed before Pilot Eckerman of the Seattle Airways, Inc., landed in the Lincoln-Page. The MacKenzie Morrow Company entry piloted by A. W. Davis landed third position a few seconds later in his American Eagle.

Interest in the two events was divided for in the big Ford-Sout plane, the first to be piloted to the Pacific Northwest, was Lieut. Commander George Noville.

One of the big events of the day was the relay race. Four teams of two planes each were entered. The MacKenzie-Morrow Aviation Company team of Portland was first; Seattle Flying Service, second; Bush Flying Service, Portland, third and Rankin Flying Service fourth.

Floyd Keadel won the dead stick landing contest when he brought his Eaglerock plane to a stop 11 feet 7 inches from the tape with a "dead" motor. Keadel received the Valentine Gephart trophy and $50 cash. Walter E. Case in an American Eagle was second, 15 feet 7 inches, and Jack Parschall in an Eaglerock, was third with 21 feet 2 inches.

Johnny West did some thrilling wing walking stunts on a plane piloted by Byron Jacobs of the Continental Airways. Frank Brooks of Coeur D'Alene, Ida., and Tommy Thompson of Seattle were the parachute jumpers.

C. L. Scott of the Seattle Flying Service, piloting a Travel Air, won the 20-mile race for OX5 motored planes. With the victory went the Philip Jackson trophy and $75 cash. Basil D. Russell of the Bush Flying Service, Portland, was second in a Travel Air and Major A. Eckman of the Seattle Airways was third in a Lincoln-Page.

Gordon E. Mounce of the Continental Airways won the Airman special trophy when he captured the 20-mile race for Whirlwind-motored cabin planes with his Ryan. Frank Anderline of the Rankin Flying service, in another Ryan, was second.

Captain Jack Clemence of the Aeronautical Pursuits Corporation, won the free-for-all race in his Travel Air. He received the Harry K. Coffey trophy. Pilot Russell of the Bush Flying Service was second and Pilot Mounce, third. They both flew Travel Airs.

The stunting contest was won by Walter E. Case in an American Eagle, Pilot Russel was second with a Travel Air and Tex Rankin and Dick Rankin, both in Wacos, were third and fourth respectively. Case's victory brought him the Feldenheimer trophy.

The First National bank trophy for the Whirlwind-motored cabin plane performance test went to the Rankin Flying Service.



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WASHINGTON AIR NEWS

By C. J. Litteljohn

THE Northwest Aeronautical Company has moved from Tacoma, Wash., to Seattle, where on June 15th it started a flying service around snow-crowned Mt. Rainier. The company operates two four-passenger Buhl airsedans. Until such time as the municipal airport is ready at Seattle, the offices will remain at Tacoma.

WESTERN CANADA AIRWAYS, LTD., establishing headquarters at Seattle, Wash., commenced a new air passenger service in June between Seattle and the two main cities of British Columbia—Vancouver on the mainland, and Victoria on the British Island—which will be a connecting link of the first international and transcontinental plane service on the American continent. J. A. Pease has opened headquarters for the company at 946 Dexter Horton Building. Eight-passenger Fokker seaplanes and Boeing flying boats are being used. The company also plans to start an airline further north than Victoria, going into the Alaskan territory.

OPERATING an airport at Bellingham, Wash., the Western Aero Construction Company has been incorporated in that city. Incorporators are A. H. Zieglitz, H. L. Stark and S. E. Payson.

SEATTLE AIRWAYS, INC., are considering the establishment of a new airplane factory at Seattle. Directors of the corporation plan to build all-metal biplanes, at first for the use of the organization, and later for commercial distribution.

NEW services are being added to the Hobi Airways Company of Aberdeen, Wash. After entering the flying school and air taxi business a short time ago, it started the establishment of a combined headquarters office, waiting room and visiting place for out of town fliers, and is contemplating the establishment of a new regular flying service from Gray's Harbor and Puget Sound points.

FIRST LIEUT. C. B. HAINES, U. S. Air Corps, has been appointed commander of 116th Observation Squadron of the National Guard of Washington. He has also been promoted within the guard to the rank of major.

BEAUTIFUL Snoqualmie Pass in Washington is to have a gigantic air beacon to guide aviators over the pass between Seattle and the Inland Empire. The Puget Sound Power and Light Company is planning the establishment of a series of these air beacons to give a well lighted aerial way in Washington.

KENT, WASH., is planning a modern airport. The Kent Flying Service, leading citizens and chamber of commerce members are developing the new field. The airport itself will consist of about 53 acres within the city limits.

Washington Aeronautical Corporation

WITH the consolidation of the Washington Flying Service and the Olympic Aeronautical Corporation, aviation in Tacoma, Washington is showing increased activity. The new company will be known as the Washington Aeronautical Corporation and will maintain its main base at the Tacoma municipal field, located seven miles south of the business district on the Pacific Highway.

The personnel of the company include L. E. Titus, president; Cassius Gates, secretary; J. B. Story and R. E. Richards, vice presidents; J. W. Sparling, treasurer; Alex B. Holden, chief pilot; Dick Gleason and R. Raybone, asst. pilots; William Gorman, chief mechanic; Orian Martin and Dutch Dahlberg, assistant mechanics.

The company is distributors for the Alexander Eaglerock and the Buhl Airsedan in Western Washington and Oregon.

Chehalis Airport

CHEHALIS municipal airport is located one mile from the center of Chehalis, Wash. The field is 1,300 feet square with an option on 50 acres directly north which is used in conjunction with the field. The city is erecting a 50 x 70 feet hangar putting in gasoline equipment and telephone. The field has three runways long enough to get off or land in the wind either way.

The St. John Air Service is operating the municipal field on a percentage basis for the City. This company will conduct a school using new Waco planes. A Ryan Brougham is used for sight-seeing.

Vernon Bookwalter, formerly with the Pacific Air Transport and one of the best known pilots in the Northwest, is in charge of the field. A. C. St. John is president of the company.

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UTAH AND IDAHO NEWS

By Glen Perrins

WITCHER B. WALKER will be traffic manager of the National Parks Airway, Inc., scheduled to open an air mail, express and passenger route July 1, between Salt Lake and Great Falls, Montana. Alfred Frank is president of the airway company. Four six-passenger Fokkers are to be used on the airline.

PILOT MAURICE GRAHAM recently brought in the regular mail to Salt Lake City in a new Pratt & Whitney 425-horsepower Lockheed ship. This plane is especially designed for Western Air Express, Inc., for work between Salt Lake and Los Angeles.

WITH the completion of the new Neon electric sign on the roof of the Newhouse hotel, Salt Lake will have one of the best airplane beacon lights to be found in the Intermountain country. The letters on the sign will be fifteen feet in height, while the superstructure will rise fifty feet above the top of the building.

ARRANGEMENTS have been perfected for the shipment of 4,000 bunches of sweet peas by airplane weekly from Huntsville, Utah to Kansas City, Des Moines, Chicago and Detroit, during the coming season, according to Louis B. Westholder, manager of the Artistic Floral company of Ogden, Utah. He has a contract with the Scenic Airways Company to do this work.

WORK will start shortly on construction of a lighted airway between Salt Lake and Las Vegas and between Salt Lake and Black mountain. There are now light beacons marking the air path between Las Vegas and Los Angeles, and between Black mountain, near Elko, and San Francisco. When the work is completed the entire route between Salt Lake and the two California cities may be covered at night.

SHEEP is herded by airplane in Idaho, according to Russell Owen, airplane sheepherder of Rupert. Owen says that widely separated bands of sheep can be herded in several hours in an airplane where it takes weeks with horses. Mail and messages are delivered by plane to isolated sheep herders who are able to communicate with the plane by ground messages.

PASSENGER air service on the Varney air line between Salt Lake City and Pasco, Washington, is promised by Scholer Bangs of the Varney traffic department. The service will begin next year.

IDAHO FALLS will open its flying field July 4. Lieut, Russell Maughan, dawn-to-dusk flier, will participate in the dedication.

TWO passenger planes, both to be used out of Woodward field, arrived at Salt Lake City recently. Harry Huking, Boeing pilot, brought in a four-passenger Fairchild plane. An American Eagle two-passenger plane, for use of the Red Raven Air club of Salt Lake and Ogden, was brought in by W. T. Benedict, company pilot from Kansas City.

WILL ROGERS, wise cracker de luxe, enroute to the Republican Convention at Kansas City, visited Salt Lake after a wheel broke down on his plane and caused him a spill in Nevada. He grabbed another plane at Salt Lake and at Cherokee, Wyoming, had another smashup. The comedian was not hurt except for scratches. He says he is the first candidate to land on his head, and being a candidate it didn't hurt the head.

ARTICLES of incorporation were filed recently for the Twin Falls Aircraft company, Twin Falls, Idaho, with capital of $25,000. R. J. Boyce, J. H. Umbaugh and L. H. Waldon are the incorporators.

ANNOUNCEMENT is made by the Union Pacific system that negotiations have been entered into with the Boeing Air Transport company for a cooperative service of airplanes and railroads between Chicago and San Francisco.

SUPERINTENDENT FELIX STEINLE, of the National Park Airways, accompanied by Pilots Ray Ellsmore and E. F. Stevenson, John Bamberger and Witcher Walker, left recently in a tour of the intended route of the air company for the purpose of locating emergency fields. Work on the new hangar is progressing rapidly.

OGDEN'S municipal airport, south of the city limits, won the approval of Lieut. Russell L. Maughan, famous dawn-to-dusk flier, when, after a thorough inspection, he said that with improvements proposed by the city, the local field should be one of the best in the intermountain states.



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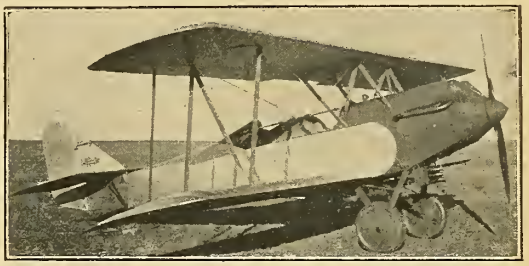
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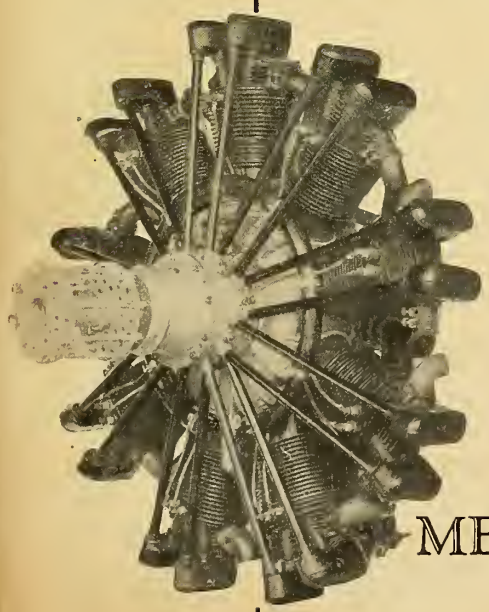
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ARIZONA AIR NEWS

By Al Wein

DUDLEY M. STEELE, chairman of the contest committee of the California Air Race Association, arrived in Tucson recently on a tour of inspection of the control stations of the transcontinental race. Planes in the race are expected to visit Tucson on September 5 and 6. Steele was accompanied by Ralph Hall, piloting a Waco.

KOCH FIELD, Flagstaff's municipal field, was dedicated on June 8. The 556-acre field is located eight miles from Flagstaff and has four runways, each 300 feet wide and ranging from 5,000 to 6,200 feet in length. Hangars and administration buildings will be erected on the field. The airport will be the headquarters for the Scenic Airways, Inc., which is planning flights over the Grand Canyon.

A BROWN-MERCURY plane, piloted by Larry Brown, president of the Brown-Mercury Aircraft Corporation of Los Angeles, was in Phoenix recently to make a test flight for the Apache Aircraft Corporation, operators of the proposed Phoenix-Prescott passenger and freight service.

AN option on the 66-acre tract used by the Aero Corporation of Arizona as its Phoenix airport was recently taken over by two prominent Phoenix business men, George E. Lilley and L. H. Gibbs, who announced they would install many improvements on the field. The option was given by the Aero Corporation of Arizona which will continue to use the field. Paved runways and two hangars are among the improvements to be installed on the field.

WHAT is believed to be the first aerial pictorial survey of an entire state got under way on May 28 when the *Arizona Republican* at Phoenix chartered a plane to make a complete tour of all cities, airports and scenic spots in the state.

The plane was chartered from the East Van Buren Airport with three men from the field being engaged to go on the survey. Sam Witten, owner of the airport and the ship, was chief mechanic, Bill Kingsley, pilot and E. D. Newcomer, aerial photographer. William A. Morrison travels ahead of the plane with Orville Bechtel, to do the laboratory work. All of the photographs taken on the survey will be used in the annual resource edition published by the *Republican* in December.

THE Buttler Safety Flying Company of Phoenix and the Mayse Air Service, Inc., of Tucson, were recently incorporated under the laws of Arizona. Both will engage in the manufacture and operation of airplanes.

SEVERAL hundred persons attended the dedication of the Grand Canyon airport on June 10. The field is owned and operated by the Scenic Airways, Inc. Planes at the dedication included the Scenic Airways' tri-motored Ford, and the Arizona *Republican's* aerial survey ship.

AIR NEWS from ARIZONA

By "Windsock"

THE city council has awarded a contract for clearing and leveling the new Casa Grande airport consisting of 160 acres. The new field is located 3½ miles NW of town on the Sacoton highway.

A NEW enclosed cabin Ryan monoplane was added to the fleet of airplanes operated by the Mayse School of Flying at Tucson.

THE Mayse Air Service, Inc., was incorporated by Paul J. Cella, sr., and Paul J. Cella, jr., both of Tucson. The company will engage in the manufacture and operation of airplanes. Provisions are also made for buying and selling airplanes and operation of airlines.

A COMBINED air school and southern Arizona agency for Eaglerock planes is being established at Tucson under the supervision of G. E. Deal. Roy Pemberton is in charge of instruction and pilot work. The school will work in coöperation with the Tucson-Phoenix-Los Angeles line of the Aero Corporation of California, supplementing that line with taxi service to all points in the southwest.

C. B. COSGROVE, member of the Tucson Aviation Committee, has established a distribution center here for Travel Air planes.

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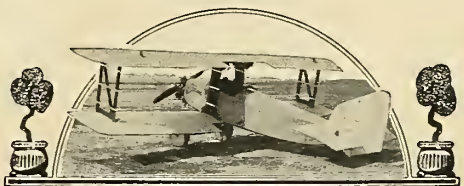
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NEWS OF THE AIR SERVICES

NATIONAL GUARD FLYING REQUIREMENTS

IN order that the regulations governing flying requirements for the National Guard shall be on the same basis as those for the Regular Army, Navy, and Coast Guard, paragraph 11 of the executive order dated March 10, 1927, has been amended as follows:

11. For each officer, warrant officer, or enlisted man of the National Guard who is in an armory drill pay status and who is required to participate regularly and frequently in aerial flights the following requirements are prescribed:

(a) During one calendar month of any quarterly period—4 aerial flights totaling at least 72 minutes, or be in the air in lieu thereof a total of 96 minutes.

(b) During two consecutive calendar months of any quarterly period, when the requirements of sub-paragraph (a) above have not been met—8 aerial flights totaling at least 144 minutes, or be in the air in lieu thereof a total of 192 minutes.

(c) During three consecutive calendar months of any quarterly period, when the requirements of subparagraph (b) above have not been met—12 aerial flights totaling at least 216 minutes, or be in the air in lieu thereof a total of 288 minutes.

(d) Such required flights may be made at ordered drills of the air corps organization to which such officer, warrant officer, or enlisted man belongs or is attached, or at other times when so authorized by the senior air corps commanding officer of the state.

(e) For fractions of a calendar month, the number of aerial flights and the time in the air required shall bear the same ratio to the number of flights and the time in the air required for a full calendar month as the period in question bears to the entire month.

(f) The duties prescribed above shall be in addition to any other duty or duties which may he required of such officers, warrant officers, and enlisted men while in attendance at assemblies for drill and instruction, and while participating in exercises or performing duties provided for by sections 94, 97, and 99 of the national defense act as amended.

This means that National Guard air corps personnel must also attend assemblies regularly during the month. National Guard air personnel who find it impossible or inconvenient to comply with the flight requirements specified in subparagraph (a) can meet such requirements prescribed in subparagraph (b), and should they not be able to comply with either (a) or (b), they can be governed by (c).



Lieutenant Zeus Soucek

GUNNERY MEDALS

LT. EARLE E. PARTRIDGE was winner for the third consecutive time of the Distinguished Aerial Gunnery Medal, with a score in this year's matches of 627.8 made in competition with 11 other Air Corps officers and 4 National Guard officers in the Pilots' Match with observation and attack planes. Lt. John Bowman was second with 544.8 and Lt. Lotha A. Smith third with 512.9

Lt. John J. Williams won the Pilots' Match with Pursuit planes, making 765.4 points. Lt. Robt. W. Douglas, jr., who flew from France Field, C. Z., with Lt. James E. Parker to enter the matches and who was winner in 1925, finished second with 751.7. Lt. Wm. L. Cornelius made third with 750. Six pilots competed in this event.

The Observers' Match was won by Lt. Orin J. Bushey, 175.5; Lt. James W. Andrew, second, 155; and Lt. James T. Shively, third, 141.5. Seventeen competed; of these five were N. G. officers and two A. C. Res. officers

The team of Lts. John F. Whiteley (pilot) and Wm. M. Lanagan (bomber) won the Bombardment match with a score of 1,537. Lts. Harold A. Wheaton and David A. Behncke took second place with 1,499, and Lts. Fred G. Richardson and Edw. H. Holterman, third, with 1,458. Seven bombing teams participated.

A summary shows 44 competitors in the four competitions of the 1928 Aerial Gunnery and Bombing Matches. Ten were N. G. officers and two A. C. Res. officers.

The new and distinctive air corps medals recently authorized, are termed distinguished aerial gunnery and distinguished aerial bomber badges.

Winners of the distinguished aerial gunner medal for 1925 were First Lieutenants Douglass, Carter and Curry. The bombing team of Lieutenants Beery and Shankle won the distinguished aerial bomber medals.

For 1926, Lieutenants Merrick, Partridge and King won the distinguished aerial bomber medals, and Lieutenant Alfred I. Puryear the last-named medal for bombing from lighter than air craft.

Captain Hugh M. Elmdorf, Lieutenants Partridge and Parker won the distinguished aerial gunner medals for 1927, and the bombing team of Lieutenants Larson and King the distinguished aerial bomber medals.

PN-12 MAKES NEW ALTITUDE RECORD

CARRYING a useful load of 240 pounds in his PN-12 seaplane, Lieut. Arthur Gavin climbed to an altitude of 18,200 feet, establishing a new American altitude record for seaplanes carrying this useful load.

Gavin used the PN-12 No. 2, a sister ship of the PN-12, which, on May 28, reached an altitude of 16,014 feet at the Philadelphia Navy Yard with Lieut. Zeus Soucek at the controls. The May 28th record has just been declared official by the Bureau of Standards, in Washington, and it was that record that the PN-12 No. 2 bettered.

Another attempt to create a new world record will be made soon. The present world's altitude record for seaplanes is 19,196 feet.

ARMY BLIMP LANDS ON SPEEDING TRAIN

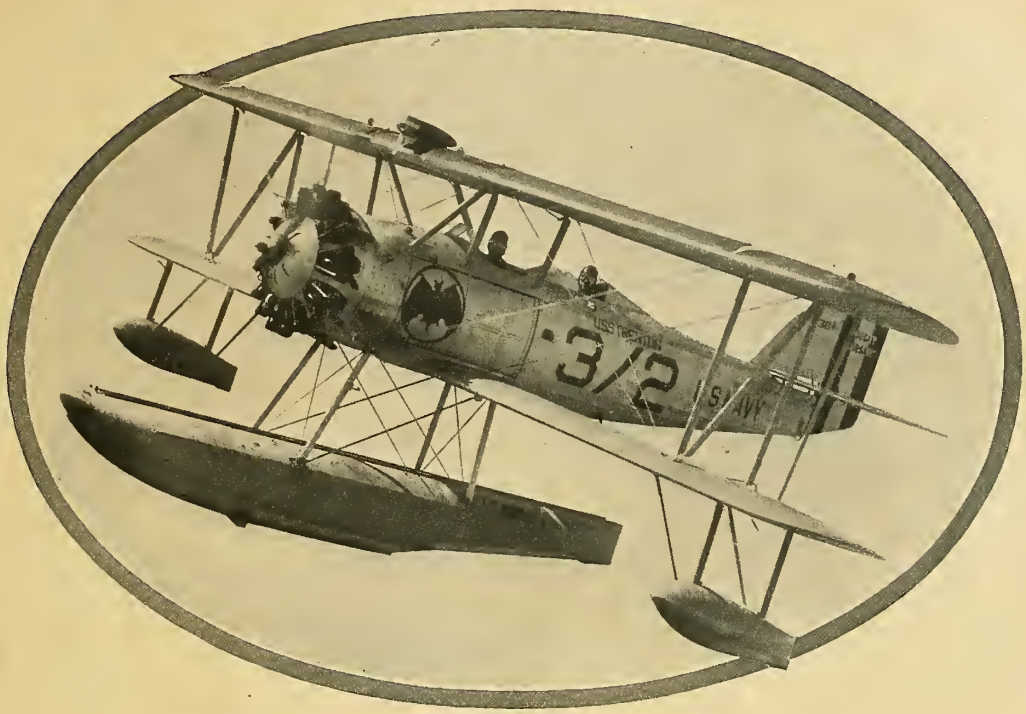
A HAND-TO-HAND transfer of a sack of mail from an army dirigible to an Illinois Central train, while both were traveling at thirty miles an hour, was made near Scott Field, Belleville, Ill., recently. Colonel John A. Paegelow, commandant of Scott Field, said the transfer was the first of the kind ever made.

The dirigible C-52, 210 feet long, carried a crew of six men, in command of Lieutenant Karl S. Axtater and Lieutenant Edward H. White.

The dirigible was over the tracks as the train came in view. The airship crew, regulating the speed to correspond with that of the train, maneuvered into position over the mail coach. Then the dirigible was brought down over the train so low that the control car rested on top of the coach for a moment while a member of the crew handed the sack to a mail clerk standing in the doorway of the coach.



Lieutenant Arthur Gavin



UTILITY

The wide range of military functions efficiently performed — on land and sea — from bombing to combat work — from catapulting to training — indicates the wide utility of Vought Aircraft.

Daily use — thousands of hours and millions of miles of flying — years of service — in our country's Air Services, have shown how many jobs Vought Airplanes can do, and do well.

And the latest Vought, the "Corsair," with its wide speed range, its capability for high speed and carrying of large loads, and its lithe agility in maneuvers even at high altitudes, has established a new standard for range of service.

CHANCE VOUGHT CORPORATION
LONG ISLAND CITY, NEW YORK

VOUGHT PRODUCTION "CORSAIRS" GIVE SUPERIOR PERFORMANCE IN SPEED TRIALS

By Dr. Michael Watter

A MOST interesting and illuminating series of airplane speed demonstration trials were recently made over the official Navy speed test course at Anacostia, D. C., by Lieut. Comdr. A. C. Miles, U.S.N., and Lieut. S. W. Callaway, U.S.N, of the Flight Test Section of Bureau of Aeronautics in determining propeller characteristics of one of the new production type Vought "Corsairs".

Several of these planes had just been received at the Anacostia Naval Air Station, having come off the assembly line at the new Vought factory in Long Island City but a few days before. After but a few hours preliminary flying to limber up the engine, one of these production planes was put through a series of high-speed trials to determine the superiority in speed which was claimed by the manufacturer for his production planes over that of the experimental ships delivered last year.

In all these trials a 9-foot diameter, 2-bladed, adjustable pitch duraluminum propeller was used, it being the type designed by Lieut. Comdr. C. H. Havill of Bureau of Aeronautics, Navy Department, and manufactured by Standard Steel Propeller Co.

The high speed runs in the demonstrations over the measured course were made first as a seaplane, and then as a landplane, the "Corsair" being of the convertible type, the wheel-type landing gear being substituted for the float gear in the latter runs. In each case, the gross flight weight specified was approximately 3,350 pounds, and the plane was loaded accordingly for direct comparison with the experimental planes. No attempt was made to eliminate the large service windshields for both cockpits, the running and navigation lights or exposed accessories and mountings. The seaplane was put through the trials even with the tail skid installed, and the wing incidence was left standard for both upper and lower wings. In addition to full tanks, equipment and ballast, an observer was carried in all the trials.

Under the above conditions, the "Corsair" seaplane showed a timed average speed of 159.1 miles per hour piloted by Lieut. Callaway in four consecutive runs up and down the measured course. In the afternoon of the same day, after the pitch of the propeller had been increased slightly, runs averaging 158 miles per hour were made by the same pilot. On the following day, with the same propeller setting but lower engine revs attributable to barometric conditions, Lieut. Comdr. Miles made timed runs averaging 156.8 miles per hour.

There then followed a series of timed trials made by Mr. Temple N. Joyce, Sales and Service Manager of the Chance Vought Corporation, with Lieut. Callaway as timer and observer. Mr. Joyce's runs averaged 156.7 miles per hour with the propeller setting holding the engine down considerably below its rated r.p.m. This was the case in all runs, due to changes in pitch settings, except for the runs made by Lieut. Callaway at an average of 159.1 m.p.h. in the initial runs.

Having thus demonstrated the high speed performance of the production Vought seaplanes over the experimental prototype "Corsairs", the float gear was removed, and the same plane with added ballast, was sent over the course the following day for timed landplane speed trials.

As a landplane, the "Corsair" showed an average speed of 159.2 miles per hour. A slight modification in propeller setting was then tried, with the result that Lieut. Callaway was able to average 160.7 with the engine turning at the rated speed, an unusually high performance for a standard service 2-seater airplane out of regular production.

Aside from demonstrating the correctness of the manufacturer's claims and guarantees of high speed, sea-level, performance of his airplanes, one seldom finds the production examples of military designs even equalling the performance of the so-called experimental models, but in the case of the Vought "Corsair" the production product has easily surpassed the high-speed characteristics of the earlier experimental models, with the added result that the production "Corsair" seaplane, loaded as a 2-place seaplane fighter is practically as fast and as maneuverable as the same plane as a landplane fighter-observation type.

A GIANT PARACHUTE

MAJOR E. L. HOFFMAN, Commandant of Wright Field, who last year was awarded the Collier Trophy for his efforts in the development of the parachute, has developed and is perfecting a mammoth parachute measuring 84 feet in diameter capable of supporting the weight of an entire airplane and bearing it safely to the ground.

Structurally it is a reproduction in all main respects of the man-carrying type, having a pilot chute, vents in the dome, the same weight and quality of silk and the same type of shroud lines. There are a greater number of panels and shroud lines; 96 of the former, 48 of the latter. Many interesting tests have been performed with the new parachute. Twice it has successfully borne to the ground a 1,600-pound bomb from the bomb bay of a plane, circling at several thousand feet altitude. So great is the lift and strength of the chute, however, that it shows little tendency to deflate upon reaching the ground and, in the bomb tests, caught by winds, dragged the great weight quite a distance across the field before it could be halted.

There is still much to be accomplished before the chute is ready for the final test of dropping with an airplane. A positive releasing mechanism, separating the weight and parachute upon landing, is in contemplation. This would eliminate the danger of dragging. Perhaps some quick deflation method will also be conceived. Major Hoffman is fully confident of the strength of the chute to support a weight equal to that of an airplane with passengers, and the dropping of an airplane with a parachute is, of course, not an unheard of experiment. Two such drops have been accomplished in California. What Major Hoffman hopes to obtain is a parachute of such simple mechanism, ease of application, and reliability of operation as to be practical for all passenger planes, the type of chute that will be dependable when manufactured upon a production basis.

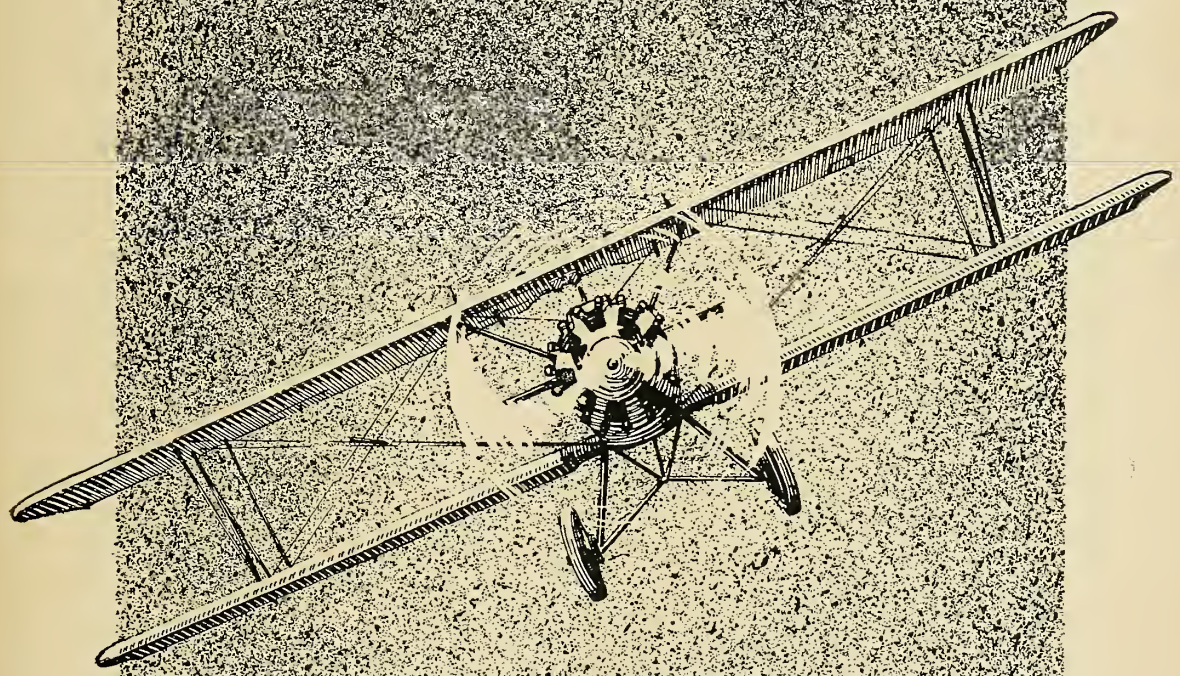
AIR CORPS TO FLY PRESIDENTIAL MAIL

THE President's mail will be transported via airplane during his summer vacation in Wisconsin. The Army Air Corps will handle the mail between Superior, Wisconsin, and Chicago, Ill., while the Air Mail Service will take care of all the east bound mail out of Chicago.



Commissioned personnel of the 1928 Army Air Corps Demonstration Groups. (See pages 31 and 32).

The Consolidated Courier



Consolidated Aircraft Corporation
Buffalo, N.Y.

CONSOLIDATED AIRCRAFT

THE AERONAUTICAL INDUSTRY

AIRCRAFT STATISTICS

ACCORDING to data collected by the Department of Commerce, the establishments engaged primarily in the manufacture of aircraft in 1927 built 1,857 airplanes, valued at $12,024,085, and 105 seaplanes and amphibians, valued at $2,226,520. The production in 1926 was 1,125 airplanes, valued at $7,448,679 and 61 seaplanes and amphibians valued at $1,442,348. The combined production of all classes of heavier-than-air craft (airplanes, seaplanes, and amphibians) increased from 1,186, valued at $8,871,027 in 1926, to 1,962, valued at $14,250,605 in 1927, the rates of increase being 65.4 per cent for number and 60.6 per cent for value. A similar comparison for 1925 and 1927, based on a production of 789 aircraft, valued at $6,673,659 in 1925, shows increases of 148.7 % in number and 113.5% in value.

U. S. Aircraft Statistics for the year 1927:

Number of establishments	61
Wage earners (average number) (*a*)	4,316
Wage (*b*)	$6,701,967
Cost of materials, including shop supplies, fuel and purchased power (*b*)	$7,373,672
Cost of materials, including shop supplies,	$7,205,165
Cost of fuel and purchased power	$168,507
Products, total value (*b*)	$20,783,733
Airplanes:	
Number (*c*)	1,857
Value	$12,024,085
Seaplanes and amphibians (*d*)	
Number	105
Value	$2,226,520
Value of aircraft under construction (*e*)	
Parts and engines made for sale, value,	$4,702,628
All other products, including repairs and experimental work	$1,830,500
Value added by manufacture (*f*)	$13,410,061
Primary horsepower (*g*)	5,813

a Not including salaried employees.
b The amount of manufacturers' profits cannot be calculated from the census figures for the reason that no data are collected in regard to a number of items of expense, such as interest on investment, rent, depreciation, taxes, insurance, and advertising.
c Includes 100 rebuilt and reassembled airplanes and 37 without engines.
d Includes 45 amphibians in 1927 and 54 in 1926.
e No data.
f Value of products less cost of materials.
g Factory horsepower, not horsepower of aircraft manufactured.

Tabulation of Civil Air Accidents and Casualties for the Year 1927

ITEM	Per cent	Number
ACCIDENTS		
Accidents to licensed pilots	17½	35
Accidents to unlicensed pilots	82½	165
		200
Accidents to licensed planes	17	34
Accidents to unlicensed planes	83	166
		200
Causes ascribed.		
Error in pilotage	50	100
Power plant failure	21½	43
Structural failure	11½	23
Weather	6	12
Miscellaneous	7	14
Unknown	4	8
		200
Accidents by classes of flying:		
Miscellaneous	72	144
Experimental	11½	23
Student instruction	10½	21
Air transport	6	12
		200
CASUALTIES		
Licensed pilots.		
Killed	17	11
Injured	18	13
Unlicensed pilots		
Killed	83	54
Injured	82	69
Total pilots killed		65
Total pilots injured		84
Passengers in licensed planes:		
Killed	22	22
Injured	78	20
Passengers in unlicensed planes:		
Killed		77
Injured		51
Total passengers killed		99
Total passengers injured		71
Grand total pilots and passengers killed		164
Grand total pilots and passengers injured		149
Fatalities by causes:		
Errors in pilotage	48	78
Power plant failure	13	22
Structural failure	13	22
Weather	6	10
Miscellaneous	8	13
Unknown	12	19
		164
Fatal accidents by causes.		
Errors in pilotage	46	42
Power plant failure	13	12
Structural failure	16	15
Weather	6	6
Miscellaneous	10	9
Unknown	9	8
		92

	Per cent	Number	Pilots	Passengers	Total
Fatalities by classes of flying:					
Miscellaneous	69	60	35	78	113
Student instruction	12	12	12	8	20
Experimental	15	14	12	12	24
Air Transport	4	6	6	1	7
		92	65	99	164
Total washouts of planes					167

CIVIL AIR ACCIDENTS AND CASUALTIES

PRIOR to the air commerce act no agency was charged with the investigation nor recording of civil air accidents, and no reliable information is available upon which to base statistics.

The Department of Commerce is required under the act to "investigate, record, and make public the causes of accidents in civil air navigation in the United States." Following is a tabulation of civil accidents in aviation for the calendar year 1927. There is no civil aerostation save free ballooning for sport and there were no accidents during the year in this phase.

In the calendar year 1927 there occurred 200 reported accidents in which 164 persons lost their lives and 149 were injured, including both pilots and passengers. Airplanes to the number of 167 were complete "washouts" —damaged beyond practicability of repair. There occur to airplanes minor accidents similar to those occurring to automobiles but cognizance is not, of course, taken of these.

Of the 200 accidents, 34 occurred with licensed planes. Eleven licensed pilots and 22 passengers were killed in licensed planes. The balance were charged to unlicensed craft.

In scheduled flying over air routes there were six fatal accidents, six pilots and one passenger being killed. The balance of the fatalities were in the course of miscellaneous flying, including air service operations; and in experimentation, including contests, races, oceanic flights, and such. The deaths in the "experimental" classification amounted to 24 and are not properly chargeable to aeronautics as a means of public or private transport.

The personal equation—error in pilotage—was the ascribed cause of 78, or 48 per cent, of the 164 fatalities.

NEW AIRLINE ROUTES and SCHEDULES

THE following new airline schedules and changes in schedules have been established since the June issue. A complete list of mail, passenger and express airlines was printed in the December issue. New lines opened since that date or new schedules have been added in each succeeding issue.

Air Mail—Passengers†—Express

C. A. M. 17—NEW YORK, N. Y., CLEVELAND, OHIO, TOLEDO, OHIO, CHICAGO, ILL. Operated by National Air Transport, Inc. (Toledo added as regular stop June 3.)

Overnight

Time Table

Westbound (Read down)				*Eastbound (Read up)*
8:00 p.m. E.S.T.	Lv.	New York, N. Y.	Ar.	6:30 a.m. E.S.T.
9:35 p.m. E.S.T.		New Brunswick, N. J.		4:45 a.m. E.S.T.
2:30 a.m. E.S.T.		Cleveland, Ohio		12:15 a.m. E.S.T.
3:20 a.m. C.S.T.		Toledo, Ohio		10:50 p.m. C.S.T.
5:35 a.m. C.S.T.	Ar.	Chicago, Ill.	Lv.	8:00 p.m. C.S.T.

Shuttle

4:55 a.m. E.S.T.	Lv.	Toledo, Ohio	Ar.	10:40 p.m. E.S.T.
5:30 a.m. E.S.T.	Ar.	Detroit, Mich.	Lv.	10:05 p.m. E.S.T.

Transcontinental

Time Table

Westbound (Read down)				*Eastbound (Read up)*
11:00 a.m. E.S.T.	Lv.	New York, N. Y.	Ar.	7:00 p.m. E.S.T.
12:15 p.m. E.S.T.		New Brunswick, N. J.		4:45 p.m. E.S.T.
3:35 p.m. C.S.T.		Cleveland, Ohio		11:00 a.m. C.S.T.
5:20 p.m. C.S.T.		Toledo, Ohio		10:50 a.m. C.S.T.
7:00 p.m. C.S.T.	Ar.	Chicago, Ill.	Lv.	8:00 a.m. C.S.T.

Passenger Rates
Chicago-Toledo, $70
Cleveland-Toledo, $30
New York-Chicago, $200
New York-Cleveland, $100
Cleveland-Chicago, $100

Reservations and Information
National Air Transport, Inc., at:
Chicago, Ill.—105 West Adams St., Traffic Office (Franklin 0293); General Office and Municipal Flying Field, 5930 So. Cicero Ave. (Hemlock 8800 and 7488).
New York, N. Y.—420 Lexington Ave. (Lexington 8044).
Cleveland, Ohio—Municipal Airport (Clearwater 1960).
Toledo, Ohio—Chamber of Commerce; Airport (Le Moyne 43).

Air Mail, Passengers, Express

C. A. M. 1—BOSTON, MASS., HARTFORD, CONN., NEW BRUNSWICK, N. J. Operated by Colonial Western Airways, Inc. (Started carrying passengers June 13.)

Time Table

Southbound (Reod down)				*Northbound (Read up)*
7:15 p.m. D.S.T.	Lv.	Boston, Mass.	Ar.	8:05 a.m. D.S.T.
8:15 p.m. D.S.T.		Hartford, Conn.		7:30 a.m. D.S.T.
‡9:15 p.m.	Ar.	New Brunswick, N. J.	Lv.	6:00 a.m. D.S.T.

Passenger Rates
New Brunswick-Boston, $25
Hartford-Boston, $15

Reservations and Information
New York, N. Y.—Royal Blue Line, Hotel McAlpin (Penn. 0169); Colonial Western Airways, Inc., 270 Madison Ave. (Ashland 7750).
Boston, Mass.—Hotel Brunswick (Kenmore 4680).
Express Service via American Railway Express Co., 40c per ¼ lb.

** No Detroit shuttle.*
† Passenger service is of an emergency nature at this time, passengers being required to travel in the regular mail and express planes and will be handled on the day flights only.
‡ Due to the fact that the route south of Hartford must be flown after dark, no passengers will be carried south of that city.

A NEW, IMPROVED GOGGLE

All the good features of the best goggles incorporated in this DeLuxe Model.

Maximum vision, curved lenses, optically correct, soft, hollow rubber cushions, clog proof ventilator in frame.

Representatives wanted everywhere

Large discounts to schools and dealers



$5.00

Why Pay More?

AVIATOR GOGGLE CO.
Mineola, N. Y.

AIR-ZIP-ONS

(Improved Flying Suit)

Corded, white gabardine, absolutely non-rip.
Genuine hookless zippers on chest and legs.
Windproof elastic wristlets.
Tailored to fit; not an overall.
Six large pockets.
Adjustable patent ring belt.
Side slits with zippers to get to inside pants pockets.
Silk embroidered wing insignia.



$9.00, all sizes from 36 to 46

AIR TRANSPORT EQUIPMENT, Inc.
Carle Place, L. I., N. Y.

OFFICIAL RESULTS OF THE NATIONAL BALLOON RACE

Place	Entry	Pilot and Aide	Place of Landing	Distance
1.	Scott Field	Capt. W. E. Kepner Lt. Wm. O. Eareckson	1 mi. N. Weems, Va. 2 mi. W. Irvington, Va.	261½ Miles
2.	C. A. Palmer	C. A. Palmer J. W. Mell	4 mi. E.SSE. Cumnor, Va.	248 Miles
3.	Detroit Balloon Club	W. C. Naylor Russell Wherritt	3 mi. W. Widewater, Va.	187½ Miles
4.	Detroit Balloon Club	G. M. LeGallee W. A. Klikoff	3½ mi. E. Connellsville, Pa.	30 4/5 Miles
5.	N. A. S., Lakehurst, N. J.	Lt. T. G. W. Settle Geo. N. Steelman	1½ mi. S. Perryopolis, Pa.	21½ Miles
6.	Langley Field, Va.	Lt. Paul Evert Lt. U. G. Ent	Foxdale, Pa., 1 mi. S. Youngwood, Pa.	18¾ Miles
7.	Goodyear Tire & Rubber Company	W. T. VanOrman W. W. Morton	Youngwood, Pa., Christy Park	17¼ Miles
8.	Cleveland Chamber of Commerce	C. K. Wollam J. F. Cooper	Near Youngwood, Pa., West Newton Road	14¼ Miles
9.	E. J. Hill and A. G. Schlosser	E. J. Hill A. G. Schlosser	3 mi. E. Irwin, Pa.	12¼ Miles
10.	Geo. Hineman	Geo. Hineman E. F. Johnson	6 mi. W. Jeannette, Pa., 5 mi. N. Irwin, Pa.	11 Miles
11.	Scott Field	Capt. Edmund Hill Lt. J. G. Fisher	Irwin, Pa.	10 Miles
12.	Gardner Motor Co., St. Louis, Mo.	H. E. Honeywell Arthur C. Hoskins	3 mi. N. Irwin, Pa., on Pa. RR. Tracks	8 Miles
13.	N. A. S., Lakehurst, N. J.	Lt. J. H. Stevens Lt. Geo. F. Watson	Pitcairn, Pa.	7¼ Miles
14.	Sun Telegraph	W. G. Bennett Walter Chambers	4 mi. W. Trafford City	5¾ Miles

NATIONAL BALLOON RACE RESULTS

THREE of the fourteen entries in the national elimination balloon race which took off from Pittsburgh, Pa., on May 30th, rode out the storm which forced down eleven bags and brought death to two airmen—Lt. Paul Evert of Langley Field, Va., and Walter Morton of Akron, Ohio—and injury to Ward T. Van Orman.

The Army entry No. 1, piloted by Capt. W. E. Kepner with Lieut. Wm. O. Eareckson, won the race and therefore will represent the United States in the International race for the Gordon-Bennett trophy at Detroit.

The official standing of the contestants is listed above.

WICHITA AIR NEWS

By Edwin W. Pryor

THE United Aircraft corporation, which took over the defunct Lark Airplane company, has been incorporated for $200,000 and plans an immediate enlargement program that will enable a capacity production of one plane a week within a month.

C. C. Baldwin, president of the Baldwin Harvester Company, is president and general manager of the company; H. R. Van Sickle, also of the company, is vice president; the other two directors are H. A. Burkheart and W. J. Herrmen. A concrete and steel building, 125 by 22 feet, has been erected during the past month, and other units are to be added immediately.

The first ship, a six-passenger cabin biplane with pilot's seat behind the cabin, has been finished and was tested May 28. Fred R. McConiga is the designer.

The United Transport company has contracted for the entire output of the company, and will use those it does not sell in its passenger services, according to A. B. Green, president, of Los Angeles.

THE first Cessna plane delivered to F. W. Heminway, of Kansas City, Mo., who has contracted for a large number of the cantilever wing monoplanes, has been delivered. Several ships have been delivered to Hemingway at his Pacific coast offices, but this is the first to the middle west.

THE Swallow Airplane company has secured three new dealers: Commercial Airways, Inc., Kansas City, Mo.; Leonard Richards, eastern Philadelphia; and Harold Hartung, Detroit. The Richards' contract calls for delivery of 18 planes within a few months.

T. H. MOFFIT, formerly of Oklahoma City, has joined the Wichita Air Service Provision company as pilot and instructor. He was in the air service technical school at Brooks Field for 18 months, before going to Oklahoma City, where he has been instructing flying students.

A 20-DAY sales and demonstration tour was started May 28 by Charles Laird, designer and general manager of the Laird Aircraft Corporation, in the Whippoorwill, the latest ship produced by the factory. Ewing "Cactus" Brierly was at the controls when the ship took off.

THE Swift Airplane Company, manufacturing two-seater biplanes in Wichita, has contracted for a number of Quick motors—converted Rhone rotaries. The motor is made into static radial type, under patents held by C. E. Quick, by the Watkins Manufacturing Company of Wichita. More than 50 branches will service the motors.

THE Travel Air factory set a production record the week of May 12 when it completed and delivered 21 biplanes in the six-day period.

JACK TURNER, vice president of Travel Air, Inc., recently was re-elected president of the Wichita Flying club. Howard Fleeson was named vice president again, and Roscoe Vaughan was re-elected treasurer and given the additional duties of secretary.

The club will entertain the personnel of the National Air Tour with a dinner at the president's clubhouse, near the California section, Wichita's new airport.

A NEW airport, one mile square, has been purchased by the city of Wichita, to be made into an AAA-rating airport immediately. The present field, one-quarter mile square, has been declared inadequate.

The field was purchased at a price of $64,000, or $100 an acre. It is virgin land, well-drained naturally.

Five thousand foot runways are to be constructed which will accommodate the largest planes. Acquisition of the large field was hastened by the announcement that Wichita will be a division stop on the Trans-Continental Air Transport, Inc., train-plane route from coast to coast.

F. M. FENTON, former army pilot and Cleveland auto dealer, has sold his automobile agency to take the Swallow airplane agency at Toledo, O.

Carl Batts and C. F. Coats, of the Grand Rapids Air Transportation company at Grand Rapids have signed dealers' contracts with the Swallow Airplane company, too.

TWO new aviation companies have been organized with headquarters in Wichita, during the past few weeks.

One is the Aircraft Steel company, which deals in cold-rolled stripped steel used in the manufacture of planes. Parts and fittings will be manufactured and carried in stock by the company. All products will satisfy the government specifications.

A. E. Martin, formerly of Dayton, O., is manager of the company.

The other new firm is the Supreme Propeller company, capitalized at $10,000 to produce all types of propellers. M. J. Stone will be manager of the factory. He has been manufacturing propellers for 14 years. Machinery is being installed in the factory now, and production will start immediately, at the rate of 25 props a day.

George H. Seidhoff, stockholder in the Cessna Aircraft company of Wichita, is president of the new company.

More than 100 students are enrolled in the Braley Flying School, and extensive enlargement is planned by Ted Braley, manager.

Second All-Kansas Air Tour

FOURTEEN cities, eleven of them in the Western part of Kansas, were visited by the 15-ship caravan of the second All-Kansas Air Tour during the week of June 5-10.

The tour was sponsored by the Wichita chapter of the N.A.A., which made a success of the first one in April, and the Wichita Chamber of Commerce. As results of the six-day flight, all of the cities visited have established landing fields, most of them permanent, and a few well-equipped with beacons and lights, and local N.A.A. chapters have been organized.

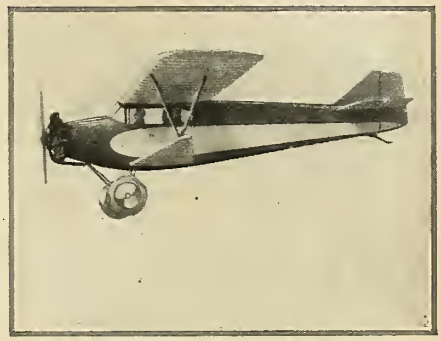
The cities visited were: Willington, Dodge City, Liberal, Garden City, Kinsley, Larned, Great Bend, Hays, Russell, Beloit, Ellsworth, Lyons, El Dorado, and Eureka, in the order named. The flight originally was scheduled to start June 4, but unfavorable weather conditions caused a one-day postponement.

The *Stanolind*, Ford plane owned by the Standard Oil company of Indiana, was flagship of the squadron of planes. Other entries included a Stearman biplane, Travel Air biplanes, a new Spartan, two Waco biplanes, and two Travel Air monoplanes. The small two-seater Swift biplane, manufactured in Wichita, acted as pathfinder.

On this tour pilots were permitted to "barnstorm," and all reported "pickings good." The larger monoplanes were averaging nearly $300 a day.

NOW THERE ARE THREE TYPES OF BUHL AIRSEDANS

To cover a very wide range of commercial and private uses. Each type is built to the high standards of strength and efficiency which characterize Buhl productions.



The BUHL Junior Airsedan

The Buhl Junior Airsedan is a smaller scale replica of the Standard Airsedan. It carries a useful load of a thousand pounds and maintains a cruising speed of 95 miles per hour.

Specifications:

Weight empty.....1,200 lbs.
Wing span.....36 ft.
Wing area.....240 sq. ft.
Length .....25 ft.
Useful load.....1,000 lbs.
Seating capacity—pilot and 2 passengers

Performance:

High speed (sea level).....110 M.P.H.
Landing speed.....45 M.P.H.
Cruising speed.....95 M.P.H.

Power Plant:

Warner
Horse power.....110 at 1,800 R.P.M.
Fuel capacity.....50 gal.—8 hours
Oil capacity.....3 gal.

The Buhl Special Airsedan is designed for use where load is subordinated to speed. It carries a useful load of 1000 pounds and has a high speed of 132 miles per hour.

Specifications:

Weight empty.....1,500 lbs.
Wing span.....36 ft.
Wing area.....240 sq. ft.
Length .....28 ft.
Useful load.....1,000 lbs.
Seating capacity—pilot and 2 passengers

Performance:

High speed (sea level).....132 M.P.H.
Landing speed.....45 M.P.H.
Cruising speed.....115 M.P.H.

Power Plant:

Whirlwind
Horse power.....200 at 1,800 R.P.M.
Fuel capacity.....80 gal.
Oil capacity.....5 gal.

The Buhl Airsedan is the standard plane of the Buhl line. It accommodates four passengers comfortably in a sound-proof, easy-conversation cabin.

Specifications:

Weight empty.....2,100 lbs.
Wing span.....42 ft.
Wing area.....334 sq. ft.
Length .....28 ft.
Useful load.....1,628 lbs.
Seating capacity—pilot and 4 passengers.

Performance:

High speed (sea level) 120 M.P.H.
Landing speed.....45 M.P.H.
Cruising speed.....100 M.P.H.

Power Plant:

Wright Whirlwind.....J.5
Horse power 200 at 1,800 R.P.M.
Fuel capacity.....70 gal.
Oil capacity.....5 gal.

Department of Commerce Certificate of Airworthiness No. 12

Distributors:

***In the Northwest*—Mamer Flying Service, Spokane, Wash.**
***In the Southwest*—Frank Baker Aircraft, Culver City, Calif.**

BUHL AIRCRAFT CO.

Marysville, Mich.

PARKS AIRPORT

East St. Louis, Illinois

A FULLY equipped airport, Parks Airport, has recently been developed on the Illinois side of the Mississippi River, three miles south of the Municipal Bridge and within 20 minutes by automobile from the heart of downtown St. Louis. It is operated by Parks Air College, Inc.

The field has been developed under the direction of Oliver Parks, vice president of Parks Airlines, Inc., and H. P. Mammen, president. Cooperation was obtained from the East St. Louis Chamber of Commerce and East St. Louis merchants and business men.

The field is located 5 miles due south of the center of St. Louis, east side of river, just off State Highway No. 3. It comprises about 140 acres of flat ground with natural drainage, with about 300 additional acres under option. The parking space adjoining the field accommodates 1,500 autobiles.

Seven buildings have been completed, including the administration building and general offices, classrooms for students, fully equipped tool shop, a restaurant, a hangar with a capacity of 16 planes, another hangar 35 x 75 feet in size, and a student's dormitory. Over $65,000 has been spent for equipment alone, not including the cost of the field. Two dormitories, each for 60 students, and two more hangars are under construction.

A gasoline storage tank with a capacity of 10,000 gallons has been installed near the tracks of the Columbia, Waterloo and East St. Louis Railway, adjacent to the field, with a pipe line to the head of the runway where the planes are serviced. The first of three hard-surfaced runways, 40 feet by 2,700 feet, designed to accommodate the largest freight and passenger planes, is finished. Boundary and floodlights have been installed and the field will soon be completely equipped for night flying.

Parks Air College now has 145 students. New students are being admitted as facilities are available. The flying school is under the direction of Derek White, dean of the college, and Clyde E. Brayton, licensed transport pilot who is chief instructor and field manager. Claude Sterling is first assistant instructor and six other flying instructors are retained in addition to mechanics, classroom and ground instructors.

The equipment at the field includes fifteen new OX5 Travel Airs in addition to two newly ordered Whirlwind Travel Airs, a Caminez Travel Air, and a new Model 6000 Travel Air Transport monoplane which seats six and bas dual wheel control.

ST. LOUIS AIR NEWS

By A. W. League

THE "Airminded Spirit of St. Louis" has come to play again. The Ford Tour is going to include St. Louis this year and from all indications we are going to be well represented. The B. F. Mahoney Aircraft Company has entered a Ryan Brougham, and the Curtiss-Robertson Mfg. Company, a Curtiss Robin, to be flown by Dan Robertson. Preparations for taking care of the flyers and the planes are going ahead at top speed.

Also, St. Louis has been picked as the central control station for the transcontinental air race from New York to the National Air Races at Los Angeles, in September; and the transcontinental passenger service using airplanes by day and trains by night will pass through St. Louis.

Definite action, however, is being delayed, pending the purchase and improvement of Lambert Field. It has been decided not to include the airport bond issue in the forthcoming election because of the danger of it being defeated at that time. However, the city is going to sell bonds for the immediate purchase and improvement of the field. Should the airport bond issue be passed at a later election the bonds will be redeemed in bulk by the city at their face value plus interest. Otherwise a certain portion will be taken care of each year until the total indebtedness is erased. The field will remain under the supervision of the Park Department and will still be classed as a municipal airport instead of a privately-owned port.

THE latest news, but by far not the least in importance, is the formation of a company to establish regular passenger service between St. Louis and Chicago, providing a round-trip daily between both cities and making connection with the proposed transcontinental airline at St. Louis. A group of bankers from St. Louis and two Detroit financiers have purchased the capital stock of the Robertson Aircraft Corporation and enlarged it from $500,000 to $1,000,000. The new company is to be headed by Arnold Stifel of Stifel-Nicholas Company, a brokerage firm of St. Louis. The present equipment of the Robertson Company now being used for mail and express will be replaced by 14-passenger trimotored Fords which will carry not only passengers but mail and express as well. The trip will consume three hours with two stops enroute—one at Springfield, Ill. and one at Peoria, Ill. The fare for the entire trip will be less than $30, or about 10 cents per passenger mile.

Additional passenger routes are planned to reach from St. Louis to Omaha by way of Kansas City and another route to the Mexican border with an eventual connection at Mexico City.

Large terminals will be constructed at each end of the St. Louis-Chicago line. A new layout will be constructed at Lambert Field at a cost of $250,000. This will consist of hangars, ticket office, waiting room, express and baggage rooms, lunch room and the general offices of the company. A bus line will be operated from Lambert Field to all the leading hotels for the convenience of the passengers.

ONE of the biggest jobs in the aeronautical world today is the educating of the business man to the possibilities of commercial aviation. Realizing that this is the master key which will open the door to aeronautical progress, the St. Louis Chamber of Commerce is educating its members along these lines. Interesting talks by recognized authorities of the aeronautical world have been the feature of each weekly meeting. Talks have been made by Lieut. S. P. Mills of Wright Field, Dayton, Ohio on recent developments of aircraft engines; Lieut. C. F. Green on improvements of airplane design; and Col. Paegelow, commander of Scott Field, on the possibilities of lighter than air. Baron C. Shibas' aerodynamic high speed motion pictures which take up to 30,000 ex-

(*Continued on next page*)



Some of the equipment and activities at Parks Air College, Parks Airport, East St. Louis, Ill.

Quality Training For Pilots *and* Mechanics

THESE pictures, better than mere words, show why the Parks Air College reigns supreme in the field of aviation schools.

Our modern airport, over $55,000.00 worth of *new training planes* alone, students' dormitory and restaurant right on the field, such motors as OX5, Whirlwind and Caminez in the Ground School—every training plane licensed by the Department of Commerce—every flying instructor a Transport Pilot!

No wonder we now have students from 40 different states—that our present students are advising their friends to come to Parks Air College —*that one student who first visited* 10 *other famous schools signed up here less than five minutes after he saw our school!*

And we now offer this superb training at a saving of $165 over regular prices! Write at once for details of this special offer and your free copy of "Skyward Ho!", our profusely illustrated catalog that gives full information about our courses. Send the coupon below *at once!*





PARKS Air COLLEGE inc.

202-D Missouri Theatre Bldg. St. Louis, Mo.

Please send me my free copy of "Skyward Ho!". I am interested in Aviation.

Name .....

Address .....

(St. Louis Air News continued)

posures a minute were shown at a recent meeting of the Chamber. These pictures make it possible for you to study the actual passage of air over an airfoil by mixing hot and cold air together and photographing the effect as the air passes over the wing.

We are also trying to educate the radio fan in the fine points of aviation. The Robertson Flying services broadcast a flying lesson every Monday at 5:15 p. m. over radio station KMOX.

ANOTHER airplane factory is in the making here in St. Louis which brings our total up to three. I don't know whether you would call it an airplane factory or not but the product of the factory is going to have wings on it and the inventor says it will fly. W. B. Chenoweth of Dallas, Tex. will supervise the construction of this airplane in the factory of Park & Bohne, Inc., manufacturers of automobile accessories. Chenoweth claims that his plane will ascend and will land vertically without employing the helicopter or horizontal propeller principle. The new airplane, according to Mr. D. E. Parks, president of Parks-Bohne, Inc., who has examined Chenoweth's plans, has one motor mounted in the center in front which acts through chain drive or other transmission on three vertical propellers, two being mounted in front, one on each side, while the third is mounted at the rear of the fuselage.

THE first of Lambert-St. Louis Field's two airplane factories—the plant of the Curtiss-Robertson Airplane Manufacturing Company, has been completed and the first "Robin" manufactured at this plant is almost ready to be test hopped. According to the working schedule of the company they will be producing about 70 planes a month before the middle of July. The "Robin" has been granted approved type certificate No. 40 by the Department of Commerce.

THE Republican Convention at Kansas City stirred up considerable activity in aviation circles here in St. Louis. Bud Gurney, Les Smith and E. L. Sloniger of the Robertson staff, and Red Jackson of the Von Hoffmann Company, deserve lots of credit for their work in bringing pictures of the convention to St. Louis under some very adverse conditions. "Bud" Gurney flew a tri-motored job equipped with all the intricate laboratory equipment necessary for developing, printing, cutting, splicing and titling moving picture film, as well as a compact dark room capable of turning out a large number of still photographs. Besides the pilot, the plane carried a staff of three men.

THE St. Louis firm of Love-Sultan, Inc., has been appointed official airport consultant for Trans-Continental Air Transport.

CONSTRUCTION work on the factory of the B. F. Mahoney Aircraft Company is being rushed along at top speed. According to John C. Nulsen, the plant will begin production about July 15th.



Movies from the air are taken by the Paramount News photographer Harry Cuthbertson. Upper views show pilot Bud Gurney and the Ryan Brougham

A NEW BULWARK OF AERIAL DEFENSE

THE airplane shown on our cover this month is the latest addition to the famous "Corsair" line. It is the new high performance Vought amphibian designed and developed by Chance Vought, in coöperation with the Bureau of Aeronautics and Naval Aircraft Factory.

This newest Vought design gave a very splendid account of itself on the recent Pacific Fleet maneuvers off Hawaii.

BARLING DESIGNS NEW COMMERCIAL PLANE

WALTER H. BARLING has completed his first ship and work on production has been started. The aviation world has looked forward with interest to the time when Walter H. Barling would introduce his new type monoplane. For three years he has worked producing this plane, the theories of design and construction having occupied his attention for many years. The details of its principles, performance, design and construction have been carefully guarded. Officials of the Nicholas-Beazley Airplane Company, sponsoring organization of this new production plane report that it will be produced in quantity in about two months.

It will be an all-metal low wing cantilever type of light construction and design. The wing is of a radically different type of design, differing from anything now on the market. It is of one piece construction with a span of 32 feet. Performance figures are exceptional and Mr. Barling has been mentioning them in conservative terms. He has placed a premium upon weight, controllability and lightness in weight and new theory of design.

Tests of this monoplane three months ago were so encouraging that work was begun immediately on a new up to date factory building which has just been completed. Methods of manufacture are also held in secrecy but it is presumed by statements of officials that there will be facilities for immediate quantity production. The first public appearance of the new plane—called the "Barling N-B", is scheduled for about August 1st. Details, specifications and performance figures are promised for an early issue of AERO DIGEST.

AMERICAN EAGLE FACTORY EXPANDS

THE American Eagle Aircraft Corporation, Kansas City, Mo., manufacturers of 3-place commercial aircraft of the biplane type, has made several expansions during the first five months of the present year. In January the company leased a new factory building at 2800 East 13th St., Kansas City, Missouri. This building is 50 x 250 ft. and at that time seemed ample room for the company's operations for a year at least.

However, the rapid increase in the demand for this type of plane has made it necessary to erect several additional buildings to take care of the factory.

Less than three years ago the American Eagle factory occupied a building 30 x 100 ft. and employed five men. Today, the corporation employs 165 factory workers, 20 office and sales employees, and four transport pilots.

During the month of May, 1927, four American Eagles were built. During the same period this year, 50 American Eagles were completed, test flown and delivered. Every 150 minutes of the working day a new American Eagle airplane is completed, tested and delivered to a customer.

The rapid growth of this factory may well be used as proof of the tremendous interest in civilian aviation today, and as a forecast of what is in store for those interested in the industry in the future.



COMING

The Nicholas-Beazley Airplane Co., Inc., together with Walter H. Barling, aeronautical engineer of international reputation, will soon have an important announcement to make to the aviation world.

The conception of aircraft design, construction and appearance will rise to a newer, higher level.

Performance, stability and safety will assume a new significance;—aviation will then be measured in new day terms.

Watch for this announcement—and set your standards high.

NICHOLAS-BEAZLEY AIRPLANE COMPANY, INC.
MARSHALL, MISSOURI

PENNSYLVANIA NEWS

By Ray Krimm

WHAT is believed to be a unique stunt in aviation circles—an "aerial picnic"—is being arranged by pilots connected with aviation companies throughout Pennsylvania. The affair will be held within a few weeks at the Pine Valley, N. J., flying field and admission will be by invitation. Each guest must fly to the picnic grounds.

Robert P. Hewitt, manager of field operations for the Ludington Philadelphia Flying Service at the Philadelphia Airport, has been placed in charge of arrangements and entertainment. Of the invitations already extended, the following acceptances have been received: Jack Throp, Waco, from Trenton, N. J.; J. Wesley Smith, president, and Virgil Kauffman, secretary, of the Philadelphia Air Transport Co., of Philadelphia and Norristown, Fairchild cabin monoplane; Allison Buck, Waco, from Wilmington, Del.; Lee Burleigh, of the Pine Valley Flying Field; Major William D. Tipton, Travel Air, from Baltimore, Md.; Archer T. Saki, of Lakewood, N. J., Waco-10; Julius Von Hayden, assistant sales manager of the Kendall Refining Co., Bradford, Pa., Travel Air; Victor Dallin, of Lansdowne, Pa., Waco-10; Major J. Sydney Owens, commander of the 28th Division Air Service, and Lieut. J. J. Gallagher, Engineering Officer; Charles R. Stewart, Philadelphia Airport, Challenger.

Hewitt will pilot one of the Ludington company's Fairchild cabin monoplanes to the picnic, with officials of that company.

E. McC. WILHELM, head of the Philadelphia Aircraft Company, recently announced the leasing of the Dempsey Farm on the Easton Highway as an airport. The field is to be dedicated soon as the Doylestown Flying Field, which covers sixty acres of level ground. The company has the distributorship for Eastern Pennsylvania, Delaware and Maryland for Swallow airplanes.

City headquarters have been established in Philadelphia. Twenty-six students have enrolled for the first class in ground instruction, which is being taught by Ensign J. R. Hoover, of the Naval Air Station at Rockaway, L. I. At the flying field, one mile west of Doylestown, the company is specializing in flying instruction and passenger hops.

SAMUEL J. IRVINE, sales manager of the Standard Automatic Products Company, of Corry, who recently returned from an extensive trip calling upon airplane manufacturers throughout the country, was the principal speaker before the Aero Club of Erie at its "Hop No. 7."

STOUT-RAUP, INC., real estate developers, of Wilkes Barre, have offered to donate 100 acres of ground to the Wyoming Valley Airport Association for the establishment of an airport to serve Wilkes Barre and Wyoming Valley.

The 100-acre plot is situated on Indian Lake, approximately fourteen miles from Wilkes Barre, and on the concrete highway leading from Wilkes Barre to New York and Philadelphia. The site lies on top of the Pocono Mountains, 1,900 feet above sea level, and if properly developed would accommodate land, amphibian and seaplanes.

AN Air Route Information Bureau has been added to the Touring Bureau of the Automobile Club of Philadelphia.

WILLIAM J. WELSH, a pilot-mechanic at Pitcairn Field, Willow Grove, Pa., during the past two years, has been sent to Richmond to succeed the late James R. Reid as a reserve pilot on the New York-Atlanta air mail route operated by Pitcairn Aviation, Inc.

C. N. Scully has been appointed chief of Pitcairn operations at Hadley Field, New Brunswick, N. J.

KEGARISE AIR TRANSPORT has started operations at Jackson Field, New Castle, Pa., and has completed a hangar that can accommodate four planes. The company has secured an agency for Alexander Eaglerock planes. R. R. Kegarise and Lieut. H. C. Sherman are handling the flying end of the company's activities.

Jackson Field is situated directly on the east side of the main road between New Castle and Erie, Pa., about three miles north of New Castle.

JAMES S. REX, owner of the limousine taxi service in Philadelphia, has organized the Rex Air Service in that city, to transport airplane passengers to and from a central terminal to airports in and near the Philadelphia district.

The new company is receiving the cooperation of the Philadelphia Airport, Island Road and Tinicum Ave., Philadelphia; the Crescent Airport, Crescent Boulevard and Kaighn's Avenue, Camden, N. J. and Bader Field, Atlantic City's Municipal Airport, operated by the Crescent Air Service, Inc.

R. SANFORD SALTUS, JR., vice president of the Ludington Philadelphia Flying Service, operators of the Philadelphia Airport, and W. L. Saunders, 2d, a medical book publisher of Philadelphia, have been appointed representatives of the National Aeronautic Association and the Federation Aeronautique Internationale in the Philadelphia district.

THE Summerill Tubing Company of Bridgeport, Pa., is operating on a day and night schedule to meet aircraft industry calls for seamless steel tubing. S. S. Gabel, president of the company, makes many of his business trips over the air mail routes so as to make a closer study of aviation. He was a recent passenger on the New York-Cleveland air mail line and is now planning a trip to the Pacific Coast.

C. L. ROLOSON, works manager, has been elected vice president of the Keystone Aircraft Corporation of Bristol, Pa.

The officials now consist of Edgar N. Gott, president; G. Tadbot Porter, vice president; Elliot Daland, vice president; C. L. Roloson, vice president and works manager; L. W. Townsend, secretary and treasurer.

WISCONSIN AIR NEWS

By Harold Alexander

AS there will be a number of people desiring to view the territory adjacent to the summer capitol from the air, W. C. (Doc) Sickner and associates of Duluth have leased a field near Cedar Island Lodge at Brule, from which his planes and others will operate. There will of course be no flying immediately above the "White House", but it will be possible nevertheless for the sightseers to see the general layout better than is possible from the ground.

The field which was selected is an 80-acre tract located about 2½ miles from the temporary home of the man "who didn't choose to run" and is about 3 miles to Brule.

Doc Sickner will operate under the name of the Brule Air Service, using American Eagles and Ryan Broughams, for which he has the agency, and will negotiate with other operators and pilots so as to have enough planes on the field at all times to handle the crowds.

Army planes (Douglas 02s) are stationed on a large field at Parkland, about ten miles from the official headquarters of President Coolidge in the Central High School of Superior. These ships transport the mail direct from Chicago, from where it will have been taken from the N A T overnight mail planes from the East. A large hangar has been erected on this site, the field has been leveled and filled wherever required and the approximately 100 foot runways have been marked with white flags at regular intervals.

THE Stevens-Point Airways Corporation has been incorporated and is constructing a 67-acre airport at Stevens Point, Wisc.

The following officers have been appointed: president, W. S. Delzell; vice president, E. G. Bach; secretary, G. A. Kenkel; aeronautic advisor, William R. Gilbo; field manager, F. A. Love.

MINNEAPOLIS NEWS

COL. L. H. BRITIN, vice president of Northwest Airways, Inc., will establish an air taxi service to Brule, Wis., for the summer. A landing field just four miles from President Coolidge's vacation lodge has been selected by Col. Britin and Charles Holman, pilot, as the Wisconsin terminal.

SUMMER visitors in Minnesota this year will find airlines available for their use in several directions from the city.

Before the tourist season is in full swing, the Jefferson Highway Transportation company will have inaugurated its 45-minute air service between Minneapolis and Rochester, using a big trimotored 12-passenger monoplane.

Another company plans to start an air schedule between Minneapolis and the Black Hills of South Dakota.

Ships of all sizes and types are available at the Wold-Chamberlain field for trips to the northern Minnesota lake country or to any other part of the state.

HANGAR DOOR PROBLEMS SOLVED



Hardware to insure easy and trouble free operation of hangar doors is fully described in this—the most complete catalog of hangar doorways ever issued

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Richards-Wilcox Mfg. Co.

"A Hanger for any Door that Slides."

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Please send me the catalog of Airplane Hangar Door Hardware.

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☐ Without obligation I would like to discuss our doorway problems with one of your doorway engineers.

Say you saw it in AERO DIGEST

MARSHALL FLYING SCHOOL

OVER 300 students have completed courses at the Marshall Flying School, ranging from private pilots, and qualified mechanics, to limited commercial pilots, in the last six months, according to recent survey of the school. Students are enrolling and graduating at the rate of three a day, coming from every state in the Union, Canada, Canal Zone, and even as far as China to attend the aviation school, and 550 qualified pilots have been graduated and not one accident has marred the record of the school in the approximate 16,000 air hours.

Twelve planes and twenty instructors are needed to take care of the large number of students at the Marshall School. Some dozen departments are correlated in instruction. The total amount of equipment represents an investment of over $60,000.

From the very start of his flying instruction, the student is given partial control of the machine, resting his hands and feet lightly upon the stick and rudder bar so he can see exactly what the instructor is doing when the ship is making maneuvers.

At first the student is allowed to pilot the plane in a straight line under the supervision of the instructor. Finally he is able to keep the plane flying straight and level himself. Then on through the logical steps, climbing and descending, turning and banking, taking off and landing. He is taught how to land directly in the wind and in cross winds.

While this instruction is going on, the instructors are observing carefully everything the student is doing, calling to his attention faults he may develop and correcting them.

A flying lesson consists of from fifteen to thirty minutes in the air with additional time on the ground discussing what the student has learned and calling his attention to points he should watch. Fifteen to thirty minutes in the air is sufficient to get instruction on certain points and is about all a student can absorb at one time.

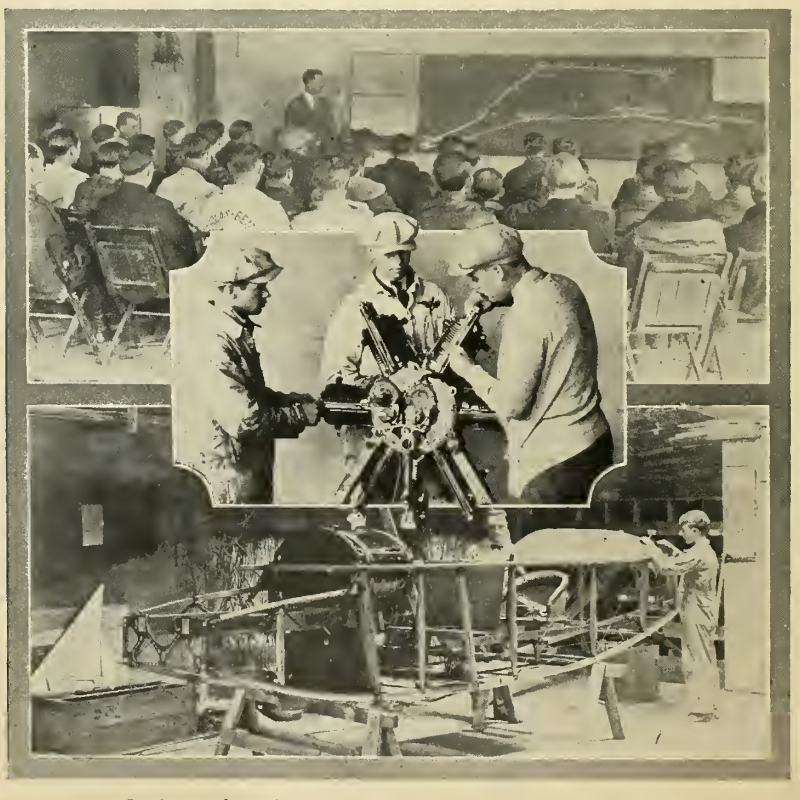
The student is slowly advanced in dual instruction until finally he is able to solo flight. After the solo flight the student will spend several hours gaining experience and confidence and instruction in acrobatics and cross-country flying.

In addition to the regular flying course, a complete course in ground work is given for those students who desire to learn the construction, repairing and overhauling of airplanes, and the repairing and overhauling of airplane engines. This work is just as important as actual flying.

The student works under actual factory conditions in ground work including engine work, fuselage work, wing building, landing gears, construction and repair, etc.

In the school and shop there are many types of engines in actual use. The student takes the different types of engines, air and water-cooled, disassembles them and builds them up.

From engines the student is advanced step by step from the fuselage department, where fuselages are built from the original steel and wood parts to the completed machine, through the wing-making room, into the rigging department where the student completely assembles the different parts of the ship ready for actual flying.



Students of the Marshall Flying School, Marshall, Missouri

KANSAS CITY NEWS

By H. H. James

A LOT of Republicans were "up in the air" in Kansas City during the Republican National Convention besides those who were delegates. The same also was true of Democrats. During that week a giant trimotored Ford all-metal plane was on exhibit at the air field of the Commercial Airways Corporation. The plane has a capacity of fourteen passengers and a crew of five. It is owned by the Rapid Air Lines, Inc., Rapid City, S. D. Clyde W. Ice, chief pilot, was in charge of the ship which brought several delegates from Indiana and Ohio to the convention.

W IRVING GLOVER, second assistant postmaster general, was in Kansas City during the Republican National Convention to look after the air mail service. The air mail preceding and during the convention broke all records, except during a special mailing campaign. Hundreds of newspaper men and features services used the air mail to send out pictures and news of the convention.

FRED HETHERINGTON, manager of the recently inaugurated flying service of the National Air Transport, Inc., reports that branch of the company's business one of its best patronized ventures at Kansas City. Two Wright Whirlwind Ryan monoplanes are in use with a third on order.

BEACON AIRWAYS OF AMERICA, INC., recently organized at Kansas City to handle the distribution of the Prudden trimotor plane and the Cessna plane in Missouri, Kansas, Oklahoma and Iowa, has announced it will add a flying service.

COMMERCIAL AIRWAYS CORPORATION, which has taken over the former Richards flying field and is making improvements on it, offers to provide a service for private owners of planes similar to that given motor car owners in storage and service garages. The planes will be provided with hangar space and will be kept in readiness for flights at any time the owner desires.

BENNETT FLYING SCHOOL has moved from the old Richards Field to the new municipal airport.

KANSAS CITY is soon to have its first electric sign advertising commercial airlines. The Ni-Sun Lines is having a sign placed on top of the Westgate hotel, in the downtown business district. The sign has 784 electric lamps.

IMPROVEMENTS at the Kansas City municipal airport, costing $70,000 or more, are expected to be made at once. The improvements will include two hangars, 80 x 100 feet, for lease to commercial air lines. The $1,000,000 bond issue for the purchase and improvement of the airport was defeated in the recent election by a narrow margin, due to the fact they were on a ballot with many other proposals that were unpopular. However, the proposal probably will be submitted again this summer and in the meantime the city plans to go ahead with improvements at the field.

AERONAUTICAL INDUSTRIES, INC.

The purpose of Aeronautical Industries, Inc., is to afford the Aircraft Industry an opportunity to secure capital from a group of investors who believe in the future of aviation. Its funds will be invested in a cross-section of the aeronautical industry both here and abroad, thereby obtaining diversification. Experts in aviation, finance and management will direct the investment policy of the company.

Information regarding any activity of the company will be sent on request.

AERONAUTICAL INDUSTRIES, INC.
Lester D. Gardner, President
292 Madison Avenue
New York City

CHICAGO AIR NEWS

By Harold Alexander

SOME interesting facts on the rapid development of the aviation industry were revealed through a survey of the aeronautical activities in the city made by the Chicago Association of Commerce.

The volume of air mail and express handled here is more than double that of any other city in the world and a greater mileage of air transport lines center here than in any city in this country.

The Municipal Airport, located at 63rd St. and Cicero Ave., the leading airport of the seventeen in the city, has an estimated land value of $10,000,000, while about $200,000 has been expended on improvements with additions continually being made to serve the demand for increased facilities. Four cinder runways with a total length of 10,100 feet are laid out on the eastern half of the 320-acre field and the western section will be improved so as to be available as a turf field for those desiring that type of a landing surface. The Illinois National Guard has two hangars at this airport and use the field frequently. Sixteen planes arrive and depart from this point each day on a regular schedule and about 600 ships come and go each month.

In order to bring the downtown section of Chicago as close as possible to an air terminal, it is the intention of the South Park commissioners to build an airport on the lake front at Sixteenth Street, filling in an area in Lake Michigan which is known as Harbor District Number Three. This field, which would be only ten minutes from the loop district, would have runways to accommodate the largest planes and would only be used for the loading and unloading of the ships, with all servicing and refueling being done at the other airports in or near the city.

Cook County, through its Forest Preserve District, has set aside three tracts of land for airports, two of which are in use. The third, which has been granted to the Illinois National Guard, has not been improved. A naval field is being built at Great Lakes, Illinois; the Sanitary district of Chicago has set aside a site for future developments; there is the Checkerboard Airport, the Ford Chicago Airport, the Pal-Waukee Airport and several others in or near the city.

In the transportation of mail, passengers and express there are seven lines out of the city that operate over contract air mail routes to the different sections of the country. The air express is a feature that is meeting with the approval of the users and although there are only about a half dozen lines in the country that have made arrangements with the American Railway Express it will not be so long before this service will be available on the majority of the routes. The Northwest Airways, Inc., have recently added the transportation of express to their present air mail and passenger service to the Twin Cities.

Although the number of aircraft companies and the volume of planes manufactured here is not as great as in several other cities, rapid progress is being made along these lines that will undoubtedly mean a substantial increase in production within the near future. It is expected that an industrial district will be set aside for aircraft manufacturers, which will be of value to the industry. The E. M. Laird Airplane Co. is one of the oldest aircraft manufacturers in the city for their first plane was built in 1912. The Laird Whirlwind, that they are specializing in at present, is a popular ship and two planes of this type won first and second place in the National Air Derby during the past year. The following other aircraft manufacturers are located in Chicago: American Aircraft Corp., Heath Airplane Co., Monarch Airplane Co., U. S. Airplane Co., Viking Aircraft Co., Wallace Aircraft Co., Western Airplane Co., and Yackey Aircraft Co.

In the distribution of airplanes and accessories, the city is well represented as it is in the number of aviation schools and aerial photographers.

The Chicago Aero Commission is the official representative of the city in aeronautical affairs. It is responsible to a large extent for the construction of the Municipal Airport and acts in an advisory capacity in its maintenance. Other organizations are promoting some phase of commercial aviation, some of them being the Aero Club of Illinois, Chicago Air Traffic Association, American Legion, Aircraft Manufacturers Association, Commercial Club of Chicago, Chicago Association of Commerce, Air Corps Officers Association and several other civic and related groups.

THE U. S. Airplane Co. of Chicago is putting into production their "U. S. Flyer", a 3-place biplane which is equipped with a self-starter as regular equipment.

The factory of the U. S. Airplane Co. is a large modern building, with 15,000 sq. ft. of floor space, general offices, etc., located in the northwestern section of Chicago near the Grayland Station of the Chicago, Milwaukee & St. Paul railroad and near the Forest Preserve Flying Field.

Leslie B. Coombs is president of the company and also chief engineer. Manuel Cooper is vice-president and treasurer. The other officials are: F. H. Jolly, secretary; W. G. Yule, general manager; E. W. Yates, production manager; and C. E. Wright, foreman.

THE photograph below of the Chicago Municipal Airport, 63rd Street and Cicero, was taken in a northeasterly direction, 63rd Street being in the foreground.

The hangar in the immediate foreground houses the *Stanolind*, the Ford 3-motor plane owned by the Standard Oil Company; in the background reading from left to right are the hangars of the Sievert Airplane Company, Boeing Air Transport, National Air Transport, Illinois National Guard (two) and Aviation Service and Transport.



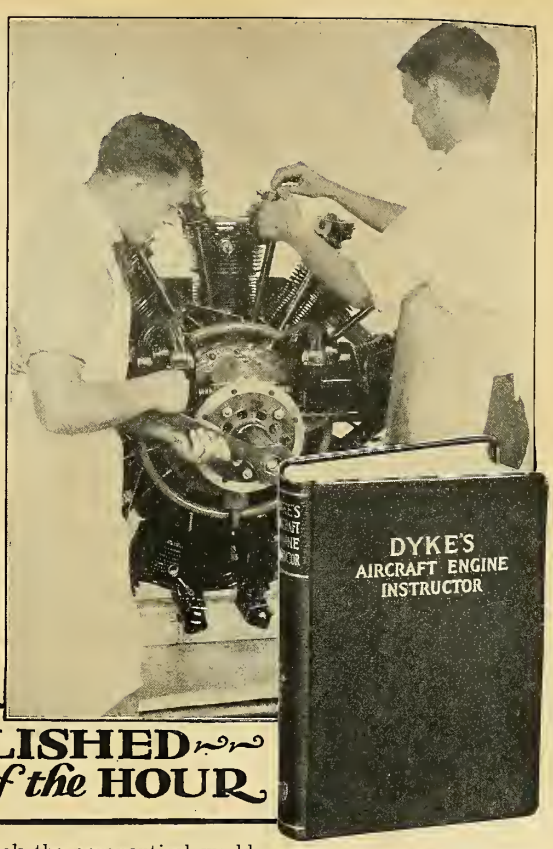
Chicago Municipal Airport, 63rd Street and Cicero. *Aerial Photographic Service photo.*

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FORT WORTH NEWS

By James Calvert

AVIATION, and especially the use of the air mail, was promoted in Fort Worth during June by a slogan contest, sponsored by the Association of Commerce. "Let-er-Fly", contributed by a school girl, was awarded first place and the cash prize.

A FEATURE of the annual West Texas Chamber of Commerce convention held in Fort Worth during June was an aerial circus, which attracted more than 100 pilots from all over the state. An airplane revue, in which 100 ships left the airport at one minute intervals to fly over the city on the opening day of the convention, was of especial interest.

This divisional chamber of commerce body is active in promoting aviation. R. W. Haynie of Abilene, president, has been so impressed with its advancement during his term of office that he has pledged to support its future development in West Texas.

REGULAR passenger service to South Texas points was inaugurated by Texas Air Transport on June 1st. The Pitcairn Mailwings have been equipped to carry two passengers each. The schedule of the regular air mail service is being maintained. Ships take off at the Fort Worth airport at 8:30 a. m. daily and return at 7:30 p. m. The fare to Houston is $30; to San Antonio, $32.50; and to Galveston, $35. In addition to the regular mail ships, T. A. T. has two Ryan monoplanes for special trips.

THREE new routes have been surveyed for regular passenger service between West Texas points, and a fourth is in the process of formation. The three already routed are between Fort Worth and El Paso, with a terminal at Midland; Fort Worth and Amarillo, across the Texas Panhandle, and Fort Worth and San Angelo, taking in the South Plains country. The fourth is a proposed loop taking in Dallas, Fort Worth, Amarillo, Lubbock and Abilene.

The first three are practically assured, according to five pilots who made the surveys and formulating final plans. They are W. T. Ponder, World War ace, who owns two cabin monoplanes; Reg Robbins, Bryan Robbins, Vernon Johns and Boyd Kennedy.

The fourth project is being planned by an organization known as the American Air Transport.

MANY oil operators, with extensive holdings over West Texas, continue to fly to and from the fields and many new ones have leased hangar space at the Fort Worth airport. Among them are W. H. Dunning, jr., who owns a Whirlwind Travel Air; Vernon Schimmel, owner of the same type ship and Fred Hyer, who makes almost daily flights to and from the oil fields in his OX5 Travel Air. Two of the larger oil companies, the Texas and Pacific Coal and Oil Company and the Marland Oil Company, also maintain planes in this city for the use of their executives stationed here.

TWO squadrons of the Aviation Cadets of America have been organized in Ft. Worth. Lectures are given on the principles of aviation at each meeting by Capt. Scott and Capt. J. L. Freeze of Dallas. There are about 150 boys in the two squadrons, the officers of which are: Squadron I—Lieut. Col. Porter Earl Glen; Adjutant, Bill Wood; Asst. Adjutant, Ralph Ridgeway; Captains: D. O. Wilkerson, Van Nance, Bill Wood; Lieutenants: Bill Phillips, LeRoy McCully, Oramel Wright. Squadron II—Major, Jerome Blount; Adjutant, Walter C. Tucker; Asst. Adjutant, Rufas Blackman; Captains, Duward Myers, Walter Shelton, Frank Swanner; Lieutenants, Chester Chenault, Wooten Wooten, Tom Gibson.

ILLINOIS AIR NEWS

Peoria Air Meet

MORE than 30,000 persons gathered at Peoria-Varney airport June 10 to witness the air meet sponsored by the Peoria Aero Club. Lieut. Wm. F. Ritter, instructor in flying for the Peoria Aero Club, was in charge of the meet.

Twenty planes took part. Four Army planes flew over from Chanute Field and the pilots acted as judges for the different events. There was a spot landing contest, balloon busting, stunt flying, wing walking, parachute drops and an old fashioned balloon ascension. Steve Lacey of Lomax, Ill., won the stunt flying competition in his Air King biplane.

FREDERICK KNACK of Aerotech, Inc., Aeronautical engineers of Moline, Ill., sailed for Europe June 2nd on the *Majestic* to study foreign methods of airplane construction.

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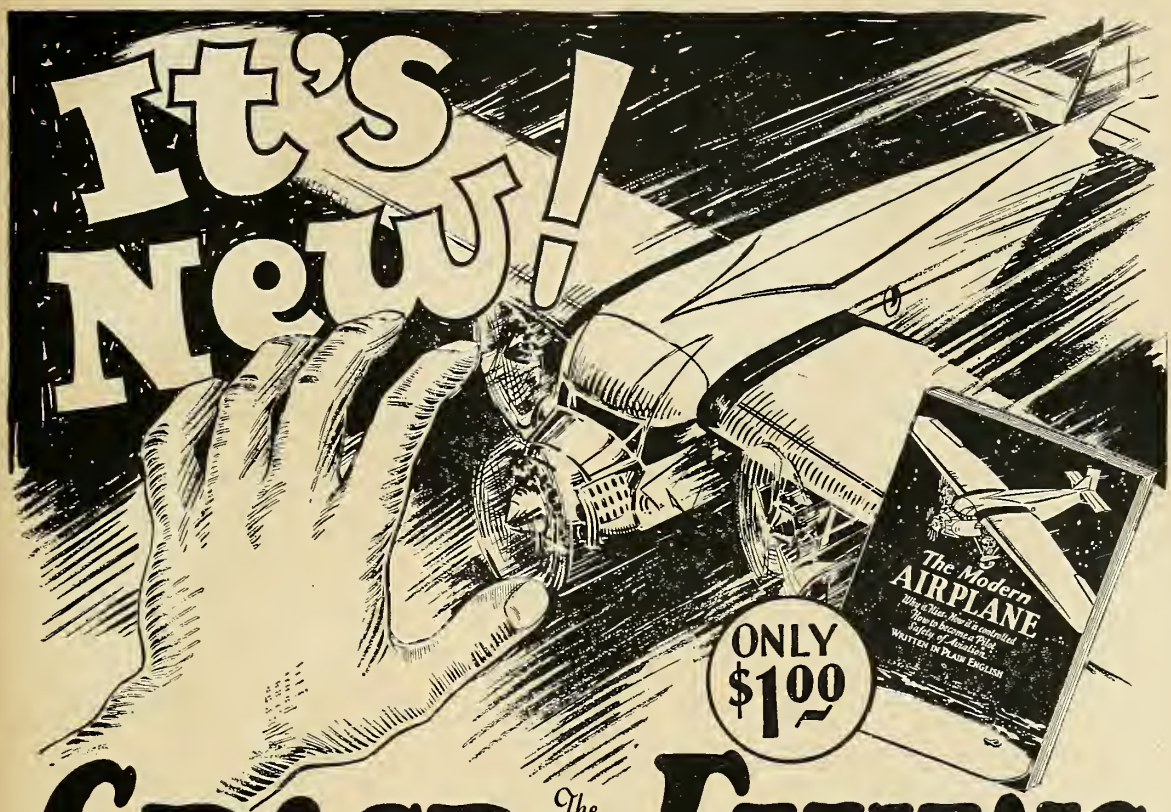
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BALTIMORE AIR NEWS

By Edward Johns

OPPOSITION to Baltimore's airport plans has come from an unexpected angle, and just when it was thought that there was nothing but clear sailing ahead. Now Baltimore is in the predicament of having some Federal officials rooting for her and some others frowning darkly every time airport is mentioned.

It is a somewhat humorous situation despite all. It concerns whether cows should be forced to walk across an airport before entering Federal quarantine for ninety days, and final decision is up to no less person than the Secretary of Agriculture. Just now the whole matter is in the hands of the solicitor for that department for a legal ironing, so that the phases of law can be settled.

It is generally known that Baltimore plans a 1,000-acre airport costing about $4,000,000, part of which is to be on filled ground. There were several objections lodged against the proposal, one by the Motor Transport Corps, U. S. Army; one by a paint company which owned adjoining land; one by the Gas Company, which owned some of the land that was to be used, and others by miscellaneous persons and companies. But all of these were soon provided for and withdrawn. But then came the belated and vigorous, if humorous, complaint.

The Federal animal quarantine station adjoins the land to be used as an airport. What, they wanted to know, will happen to them if some animals come in by water for quarantining? True, none have arrived that way for seven years, but they are likely to.

After some study the city officials arrived at the happy and simple solution, "They can walk across the airport!" But all is not settled. The matter has been referred to officials and must be passed upon by a cabinet member, it is said.

THE eighth annual exhibition of aircraft took place at Logan Field on May 20 under a murky sky that threatened storm at any time, but 25,000 persons attended.

Lieut. L. H. Sanderson took honors for the Marines by winning the pursuit race and the maneuverability contest. He also gave the crowd a thrill, when, rounding the judges' stand at the end of the second lap of the 12-mile course, he got into the backwash of Capt. R. O. Rogers' Curtiss Hawk. Without control for the moment, "Sandy's" red-nosed Boeing pursuit rolled over on its back and dived. In a split second he had it righted, however, and spinning along for the final lap. His time was 14 minutes flat for the 36 miles; Captain Rogers 5 seconds later and Major Lutz 1 second after Rogers.

Major Sidney Owens, commanding officer of the Air Corps, P. N. G., won the National Guard race by spinning around the course in 15 minutes 0 seconds. Lieut. Lyman Patterson, Maryland, was second, time 15 minutes 9 seconds, and Lieut. Earl W. Fleet, Connecticut, third, time 16 minutes 11 seconds. The race was in Falcons and the course 36 miles.

A special race between air-cooled and water-cooled engines ended as follows: Lieut. S. W. Calloway, in a Navy Vought Corsair, 14 minutes 7 seconds; Lieut.-Comdr. D. C. Watson, Navy Vought Corsair, 14 minutes 50 seconds; Major William D. Tipton, Md. N. G., Falcon, 15 minutes 10 seconds, and Capt. Charles A. Masson, Md. N. G., 15 minutes 18 seconds.

It is very interesting to analyze the remarkable time made over the 36-mile course by Lieut. Callaway, in one of the new production Vought Corsairs. These high performance Vought 2-place planes, which are powered with the Pratt and Whitney Wasp R-1300-B air-cooled radial engines, beat the Falcons by a wide margin.

Flying over the same course and distance as the pursuit ship race, Lieut. Callaway covered the 36-miles in the remarkable time of 14 minutes 7 seconds. This was only 7 seconds slower than Lieut. Sanderson's winning time in the pursuit ship race, and 2 seconds and 1 second slower, respectively, than the times shown by Captain Rogers and Major Lutz, of the Marine Corps, who placed second and third in the same pursuit race flying Curtiss Hawks.



Captain Emilio Carranza who flew to Washington from Mexico

THE French Air Mission visited Baltimore on the evening of June 13 and were entertained at a dinner by city officials and the Association of Commerce.

CAPT. EDWARD C. BLACK, air officer of the Third Corps Area, has been relieved of his duties in Baltimore and has proceeded to Rockwell Field, San Diego, Calif., where he will organize a bombardment squadron. He was succeeded by Lieut. Charles Y. Banfill, who came from Brooks Field, Texas.

A NEW company has been organized to connect the Eastern Shore of Maryland with Baltimore, from which it is separated by the Chesapeake Bay. It will be known as the Tred Avon Flying Service, with Stephen A. Hathaway as president. His brother, Andrew A. Hathaway, is vice president. Present plans call for two planes in the service, using a field at Joppa and Falls Roads as the Baltimore terminal. Passengers and freight are to be carried.

IT also has been stated that the Starlighters, Inc., of Philadelphia and Salisbury, Md., plan a service that will include Baltimore in travel from the Eastern Shore to Philadelphia. Milton K. Erdman, a Logan Field flier, is manager for this company.

LOUISIANA AIR NEWS

SHREVEPORT Airport has been established by Shreveport Airways, Inc., on the 142-acre field bordering Greenwood road, formerly used as a polo field, and adjacent to the Steere landing field.

E. B. Redline is president of this new organization. Other members of the firm are Van Lear Leary and A. J. Lanier.

The company will furnish airplane taxi service and establish regular passenger lines to Dallas and New Orleans. The airport will be opened soon with an air show, for which cash prizes have been offered for the winners of the events.

THE MEXICAN GOOD-WILL FLIGHT

CAPTAIN EMILIO CARRANZA, Mexican flier, achieved a very notable flight although he was forced by unfavorable weather conditions to fall short of his goal of a non-stop flight from Mexico City to Washington.

Leaving Mexico City at 8:10 on the morning of June 11 in his Ryan Brougham *Mexico-Excelsior*, he battled rain, storms and fogs over most of his journey, until he was forced to descend at Mooresville, N. C., early the next morning. Captain Carranza flew the 2175 miles in 20 hours. He still had enough gasoline left when he landed to fly three hours more—which would have brought him to Washington.

After a brief rest, Carranza took off from Mooreville for Bolling Field, Washington, where he was greeted by Ambassador Tellez of Mexico, Secretaries MacCracken, Davison and Warner and Major H. C. Davidson, Commanding Officer at Bolling Field. The next day he was the guest of President Coolidge at the White House.

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NEW ENGLAND NEWS

By George W. Hamblin

FOR over two years we have not had anyone fatally hurt at the Boston airport; nor have we had very many crack-ups in relation to the amount of flying done, but now we are getting all the tough breaks at once. Two boys have gone to their corners in that Valhalla that awaits us all, and fifty thousand dollars worth of airplanes has been thrown to the four winds. Four-fifth of this startling sum can be placed directly on the lack of flying facilities here and the other fifth to the ever-possible human error.

Let us not dwell on the gruesome part of this, but let's go on record with the loudest, longest shriek or wail to the skies for something to be done to keep us from losing more of our boys and equipment. "Something to be done", one hears this on all sides of this "back yard" airport of ours. Still those higher up, on Beacon Hill and School Street, pay not the slightest attention to our now frantic appeals for assistance.

We are not asking for the world, all we want is a chance to make an honest living with the assurance that the dangers are not insurmountable. When we fly at the Boston Airport, we are sure of nothing, except that in order to get back on the runway intact, with eighteen or twenty planes in the air, requires the skill of a Houdini, with the luck of a Lindbergh.

YOU all know this chap MacClain, don't you? Well, he's got him a job as chief test pilot with Pratt and Whitney down in Hartford, Conn., and so we have lost one of the best pilots on the airport here. Not only one of the best pilots, but also one of the best fellows that ever climbed into a cockpit.

AS detectives, the gang at the airport are a darn good bunch of plumbers. Bill Stultz had the tri-motored Fokker up here for two months, putting on pontoons and running water tests "for Comdr. Byrd, so he could find out what the ship would do", while all the time the ship was being tested for a transatlantic hop. We never knew a thing about it until one Sunday morning the *Friendship* was missing from its moorings in the harbor, and then Sunday night the story leaked out.

IT used to be an event when a new plane was delivered to the airport but now we have become hard-boiled, and when a carload of planes is unloaded, we raise our eyebrow and pass it off. The Boston Airport Corp. has received a carload of Travel Airs and the Bay State Flying Service has flown eight new American Eagles in from the factory. Skyways, Inc., has a carload of Challengers and a carload of Monocoupes on order. The Associated Aircraft, of which Eddie O'Toole is the works, has received two Wacos, and has three more on order.

H. E. "Wally" Wallis, of the "Hair Mile", has accepted the position of chief mechanic for the Boston Airport Corp.



Edward O'Toole of Associated Aircraft

Who's Who at the Boston Airport

WHEN we started this column, we never thought that it would lead to our finding out the innermost secrets of the boys here at the airport, but, what a revelation this stuff has been! Here's this chap O'Toole, who has the longest history of anybody we ever saw, and who is so darned secretive about it that it took us three quarters of an hour to find out where, when and why he was born. After that it was smooth sailing, and we take great pleasure in introducing Boston's first commercial flier, Edward T. "Eddie" O'Toole.

"Eddie" first saw the light of day on June 19, 1900, in Boston. He was educated in Boston and Winthrop schools, and even way back in those dim distant days, he showed a hankering for mechanics, having taken his dad's best watch apart to see what made the wheels go round. After having escaped with his life in this episode, Eddie grew up to manhood and was just in time to crash in on the rising tide of aviation after the war. He bought himself some seaplanes, of the MF and HS types, to say nothing of a few Aeromarines, and went flying. There wasn't enough business around Boston for him, so he operated down at Fall River, New Bedford, and other Cape towns. Along with his seaplane operations, he opened the first airplane repair shop in this neck of the woods, back in the days of the flying at Saugus and Lynnway.

When the present Boston Airport was opened, Eddie was the first operator on said airport, and became the first fixed base operator in New England.

Then the business grew beyond his means, and he gathered Prof. E. P. Warner in on his idea, and organized the Boston Airport Corp., serving as vice president and chief mechanic. It is Eddie's proud boast that no one has ever been killed while flying in planes that he has worked on.

Eddie, in his present company, which is described in another column, still swears by, not at, the good old OX-5, declaring that for student instruction they don't come any better, and he will use OX-5s until the last one is gone.

All in all, this guy O'Toole is quite a boy, and wonder of wonders, he does not indulge in that curse of humanity—well, ask Cy, he's just been out to the Aircraft Show.

THE Associated Aircraft, Eddie O'Toole, of course, tells us that they are nearly ready to begin operations at their field at Martha's Vineyard.

The Associated Aircraft has the following boys and girls holding down positions: Lieut. Frank C. Crowley, chief pilot; pilots Harold "Waco" Crowley, of flying boat fame, and Russell Robertson; Miss Helen O'Toole, Eddie's sister and secretary; Tony Gillotti, chief mechanic Ray "Zeke" Greene, field manager; William "Bill" Kerns, sales manager.

AFTER flying their first American Eagle in from the factory, the Amesbury Airways, Inc., have begun operations at their field in Amesbury, Mass. Harry Finnell, president of the corporation, went out to the factory and picked up Earle F. Crabbe, who is acting as chief pilot for the boys. Crabbe is a former R. F. C. man, with seven Huns and a D. F. C. to his credit. He has had about 2,000 hours flying time.

The field is on the Boston-Portland airway, and is right on the Amesbury-Hampton Road.

The following make up the corporation: Harry Finnell, president; Lester MacLinn, vice president; James Dickens, treasurer; Malcolm Hardy, secretary; Howard Bailey, Sherman Leland, Howard and Charles Eastman, James Dickens, jr., Robert Patten and Everett Martin.

OUR friend, Edgar Stone, dropped in from Springfield the other day and informed us that a new company was opening up there, namely the Springfield Airport Corp., with flying field at Fisk Park, two miles north of Springfield post office. The runways are 3100 and 2200 feet long and 1500 feet wide.

The company has secured the distributorship of Command-Aire planes and have two of these planes on the field at present, along with a Waco. It is planned to run an air meet, June 30, July 1, 2, 3, 4 to open the field and start the company off in good style. The writer has been appointed Boston representative on the air meet committee.

The corporation is composed of Jack Forer, president; James Moriarity, vice president; Edgar Stone, secretary and Morris Forer, treasurer.

WITH the delivery of their first Lincoln-Page, the Pilgrim Air Service starts operating. Al Anderson and Joseph Dunn are the owners, and Lieut. Stanley E. Beck will act as pilot. They plan to work from the Boston airport here until they locate a good field out of town.

BEVERLY Aero Club dedicated its new 20-acre flying field at North Beverly during June. Fifteen hundred spectators witnessed the events in which Army and Navy planes and commercial aviators participated.

Beverly's new flying field has two runways, one of 1 500 and the other 1,350 feet long; it has a location circle, and, when improvements are completed, it will be one of the finest in New England.

(*Continued on next page*)

The Monocoupe
Registered Trade Mark



The *Golden Franchise* of the Ultimate Plane for the Private Owner

OUR MAIL brings us scores of inquiries every day regarding our franchise.

Without exception it is the most eagerly sought and highly prized franchise in the aeronautical world today.

It holds forth golden opportunity—the opportunity to make money—lots of it.

For—it enables our dealer to sell the lowest-priced deluxe cabin plane in production, the famous "Monocoupe," to the private owner, and the private owner constitutes a huge and rapidly expanding market—a market whose growth is literally astounding.

Powered by the phenomenal new Velie five cylinder, air cooled, radial engine, the "Monocoupe" turns out twenty miles for each gallon of gas, cruises at 85 or does 100 miles an hour wide out. This Velie motor will get you there and back, with the same dependability you expect from radials of the five and seven thousand dollar class.

Your territory may yet be open. Wire or better still, visit our busy factory of 350,000 square feet at Moline, Illinois.

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Builders of the Monocoupe and the Monocoach

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What's so "Funny" about a man like *this*?

Why are Correspondence Schools joked about? Aviation itself wasn't taken so seriously at first, you know. In fact, there was wide-spread doubt as to the sanity of the Wright brothers.

There is no essential difference between studying a textbook in a classroom and studying a textbook at home. And when a man has the initiative, will power and strength of character to master a subject "on his own", isn't he the man most apt to prove himself a dependable employee? He is. I'll bank on him every time.

I Teach Aviation by Mail

Understand first of all that my Course makes no attempt or claim to teach students to *fly*. I leave that to the actual flight instructors. But if handling the sticks were all that has been developed in Aviation, it wouldn't be an industry today. It might still be bounded by the limits of Kitty Hawk.

You know how many *kinds* of jobs there are in Aviation. To handle any of them properly, a man must know what he is doing and why he is doing it. But how is he going to learn the fundamental facts and mechanical principles of the Industry? Some men who can afford it and who have the time, attend ground schools. Others enroll with Correspondence Schools. The latter method even offers distinct advantages, because the student—away from an airport environment where *flying* is the prime consideration toward which all other instruction is hastened—is actually able to more thoroughly master the basic theories and principles.

I have a book I'd like you to read. It will prove to you that Aviation is being taught by correspondence—it will give you a clear idea of what Aviation Institute is doing. May I send you a copy? The coupon tells me "yes"!

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Aviation Institute of U. S. A.
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Kindly send me a copy of your booklet outlining your home-study, "ground-work" course in Aviation.

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(New England News continued)

GUGGENHEIM AERONAUTIC BUILDING DEDICATED AT M. I. T.

THE Daniel Guggenheim Aeronautical Building at Massachusetts Institute of Technology was dedicated on June 4th.

Harry M. Guggenheim, president of the Daniel Guggenheim Foundation for the Promotion of Aeronautics, which made a grant of $230,000 for construction of the new building, was one of the speakers at the dedication exercises at which Dr. Samuel W. Stratton, president of Technology, presided.

The Hon. Edward P. Warner, Secretary of the Navy for Aeronautics, and head of the Department of Aeronautical Engineering at Technology on leave of absence, also spoke.

The dedication address was made by the Hon. William P. MacCracken, Jr., Secretary of Commerce for Aeronautics. Another distinguished speaker was Captain Jerome C. Hunsaker, who was an instructor in aeronautical engineering when the course at Technology was in its infancy.

The James Means Memorial Medal for 1928 was awarded during the ceremonies to Samuel Niedelman of New York City, whose essay on "Intercommunication between Aircraft and the Ground" was declared to be the best submitted. Niedelman is a member of this year's senior class.

A special exhibition of aeronautical instruments was arranged for the dedication.

The need for additional space for class rooms and laboratories was urgent. The new building, with additional equipment, large laboratories and numerous class and drafting rooms, gives the Institute unexcelled facilities in this branch of engineering.

BARNES AIRPORT DEDICATION

THE Westfield-Holyoke airport was officially dedicated on May 25, 26 and 27th. This airport, operated jointly by the Westfield and Holyoke Chambers of Commerce, is soon to have a complete lighting system for night flying. The field was donated by Vincent E. Barnes.

Mayor Harry B. Putnam of Westfield gave the dedicatory address, Holyoke being represented by Mayor Fred G. Burnham and Hugh McLean, president of the Holyoke Chamber of Commerce.

A program of aerial events followed.

In the race from the airport to Springfield, Mt. Tom and back, for planes over 100 h.p., Lieut. J. K. Noble, in a Curtiss Falcon plane came in the winner in 17 minutes and 27 seconds, while Lieut. R. B. Appel in a DH was second in 17 minutes and 50 seconds.

Ralph "Kitty" Barrows in his Fairchild monoplane won the dead stick landing contest, also the race to Greenfield. Lieut. Richard E. Cobb won the prize for stunting. A thrilling demonstration of stunting was performed by Bert Acosta in Barrow's plane. There was a parachute jump by Walter H. Johnson.

Professor W. F. Ease of M. I. T., Joseph P. Kivitsky and Dr. Leo Byrnes were the judges.

CONNECTICUT NEWS

THE 118th Observation Squadron will use the 141-acre Morgan farm near New London as a training area from July 5-22. The land included within this area is about one-half of the tract on which the State has an option until May 30, 1929, with a view to the establishment of a possible future airport to be used in connection with the four-day transatlantic steamship line.

THE National Marine Lamp Co. of Forestville, Connecticut, who for the past twenty years have manufactured marine lamps, marine hardware, fuel tanks and various other sheet metal, stamped and cast articles, have established an aircraft division.

P. G. Zimmermann, who since 1914 has been actively identified with the aircraft industry, has been retained in the consulting capacity to start the operation of this department.

THE Danbury Aero Club of Danbury, Conn., recently elected the following officers: president, Berkeley H. Hill; vice president, Arthur Graef; recording secretary, Curtis Wilson; financial secretary, Joseph Platt; corresponding secretary, George Gammie; treasurer, Henry H. Taylor; sergeant at arms, Joseph Repko.

The club has 53 paid in members, and the following honorary members: Governor John H. Trumbull; Commissioner of Aviation, Capt. Clarence Knox, and J. Newton Williams.

The Danbury Airport is being put into shape for an anticipated busy flying season.

Pioneer and Consolidated Instruments Standard Guides for the Aviator



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Fuel Pressure Gauge
Fuel Strainer
Hand Fuel Pump
Holt Flares
Lamps, Instrument
Landing Lights
Navigation Lights
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Oil Pressure Gauge
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IN his notable flight to the Pole and on his trans-Atlantic flight, Commander Byrd carried Pyrene Fire Extinguishers because he had to have dependable protection against fire.

For the same reason, Lieutenant-Commander Read on the NC-4 and Chamberlin and Levine, on their trans-Atlantic hops, were protected with

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Approved by Underwriters' Laboratories



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Pyrene extinguishers helped to make history on most of the important flights. Wherever the need for fire protection exists—on land, on sea or in the air—the dependability of Pyrene fire equipment inspires confidence.

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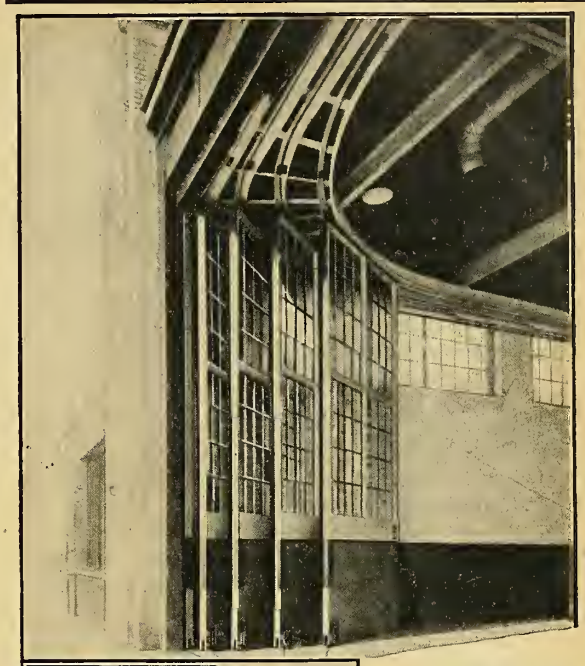
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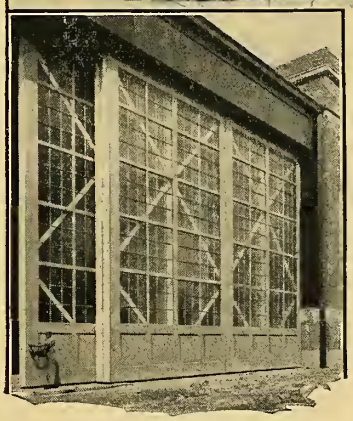
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Close-up view of Truscon Steel Doors, Curved Track Type, in Ford Airplane Hangar, Lansing, Illinois. Albert Kahn, Inc., Architects. Ralph Sollitt & Sons, Contractors.

U. S. Dept. of Aviation Assembly bldg., Dayton, Ohio. Note size of Doors: Each leaf 20'—0" x 35'—0" high. Weight of single leaf is 7 tons.

Distinguished Service

No ordinary door will do for airplane hangar construction, because entirely different engineering problems are met with there. The necessity for clear span means the elimination of center supports, thus forbidding a roof construction strong enough from which to hand gigantic doors. Truscon Airplane Hangar Doors, meeting every one of the special requirements of such installations, are giving distinguished service in important hangars throughout the country. Let Truscon solve your door problem.

Catalog and complete information on request.

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NEW YORK AIR NEWS

WILLIAM WAIT, jr., well known Curtiss airplane designer, has joined the Chance Vought engineering organization. Mr. Wait was one of the oldest members of the Curtiss engineering department, having entered Curtiss employ in 1917, at the Buffalo plant. Later when the engineering and experimental division of the Curtiss activities were removed to Garden City, N. Y., Mr. Wait was transferred there.

In his Curtiss connection, Mr. Wait's experience covered a wide range of activities and duties, outstanding among which may be mentioned his engineering and design work on the Curtiss racing planes, the "Hawk" series and the new Curtiss "Robin". Mr. Wait is an active pilot, having learned to fly in 1923.

THE Pilot Laboratories of Brooklyn, N. Y., engineers and manufacturers of radio parts, recently purchased a Stinson-Detroiter built especially with the requirements of radio research in mind. The plane will be used for experimental purposes, and is being fitted out with a complete transmitter and receiver, as well as experimental apparatus.

The radio engineering is in charge of Zeh Bouck and M. B. Sleeper. Louis Meyer is piloting for the company. The plane is kept at the Air Associates hangar at Curtiss Field.

THE Loening Intercollegiate Trophy Race, the first competitive event planned for college fliers, has been postponed until September 1 to give the entrants more time to comply with the contest regulations. The race was originally scheduled to be held at Mitchel Field, L. I., on June 16.

THE Floyd Bennett airport, dedicated to Commander Byrd's pilot, who died of pneumonia while en route to rescue the crew of the German plane *Bremen* at Greenly Island, was opened at Glens Falls, N. Y., Bennett's home town, during May.

CASEY JONES with two officials of the Pennsylvania Railroad, Charles H. Mathers, jr., assistant general traffic manager, of Philadelphia, and Major C. E. McCullough, general passenger agent, of Washington, left for Europe recently to study airplane systems, preparatory to the opening of the transcontinental air and rail passenger service.

ROOSEVELT FIELD will be saved from the real estate subdividers and converted to an "American Croydon". Paul Lannin, owner of the field and president of the flying school on the field states that two hangars which housed many historic planes will be replaced by six large hangars of fireproof concrete and steel, along with machine shops, service stations and an elaborate system of searchlight and radio beacons. Construction will start September 1.

THE Beck Distributing Corp. has recently been awarded U. S. Navy Contract No. 8294 for a large quantity of aviation goggles of the "Navigator" type.



Construction classes at the Aviation Engineering School, New York City

ENSIGN LINUS CONGDON, of the Rockaway Naval Air Station, gave a talk on propellers to the members of the Hebrew National Orphan Home Model Airplane Club at H. N. O. H., 407 Tuckahoe Road, Yonkers, N. Y., on May 31. The talk preceded a special showing of motion pictures on U. S. Navy flying, shown through the courtesy of the Bronx Flying Club.

The H. N. O. H. Model Airplane Club will be represented in the National Model Airplane Contests at Detroit by Jesse Davidson, its president, who will enter a scale model of a Ford trimotored monoplane.

THE Fairchild Air-Cooled Engine Fellowship for research in the correlation of aerodynamics and thermodynamics in the Daniel Guggenheim School of Aeronautics of New York University has been awarded to Kennedy Furlong Robert, of Oswego, N. Y., a post graduate aeronautical student at New York University.

WITH over 25,000 people in attendance the Norwich Airport was dedicated on June 14 under the auspices of the Norwich Post 189 of the American Legion and the Central New York Airways, Inc., distributors for Fairchild cabin monoplanes. More than fifty planes participated in the ceremonies.

JOSEPH L. BERRIE has been appointed business manager for Barrett Airways, Inc., whose flying field is located at Armonk, N. Y. Mr. Berrie is an accomplished flier.

O. A. HASSE, formerly executive vice president of the Glidden Company, has been elected a vice president and director of the Valentine Company, manufacturers of varnishes and enamels, and will serve on its executive committee.

Valentine & Company was established in 1832. In recent years the company has extended its activities in important directions, among others being the organization of subsidiary companies in England and France.

THE 480-million candlepower revolving searchlight which crowns the Hotel St. George in Brooklyn, henceforth will be designated on all official government airmaps as the "St. George Searchlight-Beacon" marking to fliers the correct route to the Long Island airports.

The beacon is visible 250 miles. It weighs three tons, requiring 30,000 watts an hour as well as three motors and three men to operate. The beacon was built for the owners of the hotel by the Sperry Gyroscope Co. and constituted a splendid private contribution to air travel progress.

THE Stuyvesant Aeronautical Society presented a model airplane exhibit in the Stuyvesant High School Library during the latter part of May. The models included many different types of airplanes, including record breaking planes, Army and Navy models, wartime and modern commercial types. Plans for the construction of models were on display as well as photographs of aeronautical interest and accessories, such as propellers, aviation goggles and pontoons.

THE Endicott, N. Y. Airport was opened during the latter part of May with a very successful air meet. The field is a good east and west field, over half a mile long and about 1,800 feet wide. Hangar space for two planes and gasoline and oil are available, and transportation to the city is furnished.

THE price of the new Loening Cabin Amphibian was increased $2,000, effective June 1st. The new price, delivered for flight New York, is $26,700.

THE Consolidated Instrument Company of America, Inc. has received a contract from Thunderbird Aircraft, Inc., of Los Angeles, California, for complete Consolidated instrument equipment for one year. In addition to other Consolidated products, Thunderbird planes will be equipped with the Consolidated Type A indirect lighted aircraft instrument panel.

Schenectady Air Meet

MORE than 100,000 persons saw the air pageant that served in the dual capacity of dedicating the Schenectady Airport and inaugurating air mail service to Cleveland on June 1, 2 and 3. While the Schenectady Airport, a community-owned corporation fostered by the Chamber of Commerce, has had hangar, station service and lighting facilities since last fall, formal dedication was held over until June.

The three-day program included races, a superb exhibition by a squadron of Marine Corps planes from Quantico, Va., under command of Major L. M. Bourne, a series of parachute jumps by Walter Johnson, deadstick landings, and a number of other events.

The Schenectady Chamber of Commerce, the Schenectady Airport, Inc., and the Schenectady Chapter of the A. A. A. jointly sponsored the pageant, which was under the direction of the National Air Pageant Association of Boston. Prizes were donated by Schenectady business firms and aviation bodies.

The referee was H. C. Ritchie, of the

(*Continued on next page*)

AIRPLANES—SUPPLIES FLYING BOATS MOTORS

Dandy, unused Curtiss JN4D airplane equipped with slightly used OX5 motor, $1,425. Slightly used Curtiss JN4D airplane, excellent condition, $1,175. Very moderately used plane, excellent condition, $975. J-1 Standard, unused, less motor and motor equipment, $850. Unused J-1 Standard, less motor and motor equipment, but converted to receive Hispano motor, $975. Unused, dandy JN4D, less motor and motor equipment, $950.

JN4D landing gear strut, front, $2; rear, $2.50, or set of two front and two rear, $8. 26 x 4 dandy, unused tire, $6 or slightly used, $4. New inner tube, $2.25. 26 x 4 wheel, $8.50. 750 x 125 wheel, $8.50. Dandy, unused tire, $10 or unused passable tire, $6.50. Surplus tube, $1.50 or new production, $3.25. Adaptors for installation DH wheels on JN4D or Standard, $8.50.

Set of three navigation lights, $6.50. Dandy oil or water temperature gauge with tubing, $7.50. 120 lb. oil gauge, $1.50. 10 lb. air gauge, $1.50. Climb or banking indicator, $2.50 or illuminated type, $4.50. Fore and aft inclinometer, $8.50. Vertical compass, $16.

Primer of Air Navigation, $2.50; Dyke's New Aircraft and Engine Book, $5; Modern Aircraft, $5; Airplane Speaks, $3; Aerobatics, $3.50; Aviation Engines, by Victor Pagé, $3.

JN4D or Canuck metal wing skids, $3 per pair. JN4D Station 3 struts, $2. Canuck, JN4D or Standard tail skid with shoe assembly, $4. Tail skid (wood) only, $2. Rotary map cases—rotate as trip progresses—$2.50. Log books: pilot, 50c.; engine, 50c.; airplane, 75c. or set of three, in one binder, $3. New fresh Nitrate dope, 1 gal., $1.75; 5 gals., $7.50; 25 gals. or more, $1.35 per gal.; 50 gal. barrel, $62. Dope thinner, $1.70 gal.; Gov't spec. cotton cloth, 50c. sq. yd.; 50 yds. or more, 49c.; 100 yds. or more, 48c. Airplane linen, 70c. yd., 50 yds. or more, 65c. Cotton and linen covers, all made for Canuck, J-1 Standard and JN4D. Special: Canuck lower wing linen cover, $12.50.

Fireworks: flash bomb for day or night, $4. Flag bomb for day, $3.75. Smoke trail, lasts 5 min., $3.50. Triple smoke trail, lasts 10 min., $8. Spectacular night plane display with instructions, lasts 14 min., $36.

Protex curved lense goggles, $5.50. Pilots' curved lense goggles, $4.50. Lamoglas, wide-vision, non-shatterable goggles, $4. RAV rubber bound goggles, $4.50. Jumbo goggles, oval, non-shatterable, $2.25. Gosport two-way speaking tubes with O. D. helmets, $12.50; one-way, $6.50.

Liberty cylinders, $20 or, with slightly jammed water jackets, $15. OX5 piston rings, 15c. or .005 or .010 oversize, 20c. OXX6 piston rings, 30c. OX5 piston pins, 50c. OXX6 piston pins, $1.10. Tissue paper parachutes for advertising purposes—prices on application. Exhibition parachutes, single drop, $90 or with silk shroud lines, $105. Double drop, $170 or with silk shroud lines, $185. Parachute harness, $10.50. Excellent Floyd Smith type, 26 ft. exhibition parachute with silk shroud lines and harness, complete, $75.

J-1 Standard upper covered wings, $150; lower covered wings, $110. JN4 or Canuck upper wings, covered, $90. JN4 lower covered wings, $75. Canuck lower wings, covered, $100.

New Hamilton-OX5 propellers, with wood spinner, $88. New Hartzell-OX5 propellers, with wood spinner, $80. New Hartzell-Ryan siemens propellers, with wood spinner, $80. New Hamilton-Whirlwind propellers, with wood spinner, $126. New Hartzell-OX5 propellers, without spinner, $70.

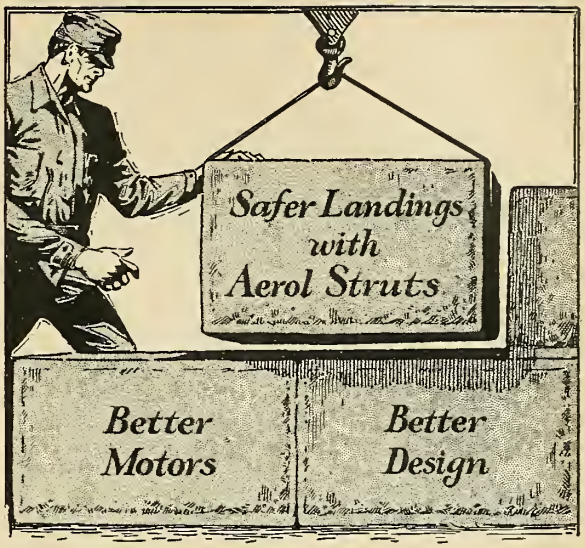
All parts for JN4D, Canuck, J-1 Standard, OX5, OXX6 and many Liberty, Hispano, Clerget, LeRhone, Fiat and Lawrance parts.

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AEROL shock absorbing STRUT

(New York Air News continued)

Aviation Lighting department of the General Electric Company, president of the Schenectady Chapter of the N. A. A. and chairman of the Chamber of Commerce aviation committee.

Among the pilots who took part in the program were Major L. M. Bourne, Lieut. Brice and Sergeant Belcher of the Marine Corps, Lieut. Eller of the Connecticut National Guard, Lieut. Robert Fogg, "Kitty" Barrows, Charlie Dixon, O. M. Mather, Charlie Arnold, White, Wright, Berry, Hotaling, Meyers, Generous, V. A. Rickard, and Lieut. Philip Lucas. Three ships from the New York State National Guard were also on hand, with Capt. L. G. Brower, and Lieuts. Elliott and Myers.

RYE, N. Y. AIR MEET

THE program for the two-day seaplane and motorboat races at Playland, Rye, N. Y., is as follows:

CIVILIAN DAY—JULY 11, 1:00 P. M.

1. Grand assembly of planes; paced parade of motorboats.
2. 151 hydroplanes (limited and unlimited), 1st heat.
3. Free-for-all seaplane race up to 100 h.p.
4. Outboard motorboats, Class B amateur, 2 laps. (Open to residents of Westchester County, New York, and Fairchild County, Connecticut.)
5. Dead stick land—seaplanes.
6. Outboard motorboats, Class C amateur. (Open to residents of Westchester County, New York and Faircbild County, Connecticut.)
7. Outboard motorboats, Class B free-for-all, 1st heat.
8. Flying-boat race up to 200 h.p.
9. 151 hydroplanes (limited and unlimited, 2nd heat.)
10. Free-for-all commercial seaplanes.
11. Paracbute jump.
12. Outboard motorboats, Class B free-for-all, 2nd heat.
13. Outboard motorboats.
14. "Seagull" races.
15. Outboard motorboats, Class B free-for-all, 3rd heat.
16. Stock runabouts.
17. Laconia outboard motorboats.
18. Outboard motorboat race for aviators.
19. Combat plane bombing motorboats.

SERVICE DAY—JULY 12, 1:00 P. M.

1. Grand assembly of aircraft; paced parade of motorboats.
2. 151 hydroplanes (limited and unlimited), 3rd heat.
3. Match seaplane race for Admiral Josepbthal tropby.
4. Outboard motorboats, Class D, 1st heat.
5. Formation and combat flying.
6. Outboard motorboats, Class D, 2nd heat.
7. Dead stick landing.
8. Outboard motorboats, Class C, free-for-all, 1st heat.
9. 151 hydroplanes (both classes).
10. Handicap race for service planes.
11. Outboard motorboats, Class C, free-for-all, 2nd heat.
12. Relay air race—service planes.
13. Outboard motorboats, Class C, free-for-all, 3rd heat.
14. Parachute jump.
15. Outboard motorboat relay race (teams of A, B and C).
16. Seaplane race for women pilots.
17. Visit of *U. S. S. Los Angeles*
18. Stock runabouts.
19. Laconia outboard motorboats.
20. Outboard motorboat race for aviators.
21. Combat plane bombing motorboat.

UTICA AIR NEWS

By Harry Ward Seward

THE new airport of Utica, N. Y., located seven miles from the city towards Rome, was auspiciously inaugurated June 2, when to the cheers of more than 3,000 air-minded citizens, air mail service for Utica on the coast-to-coast route was launched.

Piloted by W. H. Proctor, a Fairchild monoplane, operated by the Colonial Western Airways Company which has the mail contract for the route, brought in the first mail from the west. Merle A. Moltrup, flying a Pitcairn Mailwing, carried the first load of mail from the east.

Members of the local luncheon clubs and officials of the Utica post office welcomed the fliers. Escort planes, carrying Mayor Fred J. Rath, and Editor Paul B. Williams of the *Utica Daily Press,* two Uticans who have worked hard to bring air mail and passenger-carrying service to the city, accompanied by Maj. Gen. John F. O'Ryan, president of the Colonial Western Airways, added to the occasion. Warren Eaton, Norwich, N. Y., secretary and treasurer of the Central New York Airways, Inc. flew in in another Fairchild plane for the opening.

The Colonial Western Airways, Inc., have appointed M. Vernon Little manager of the Utica office and headquarters have been established in Hotel Utica.

PLANS have been completed for the incorporation of a $50,000 company to carry on a school and local passenger and express service in Utica, it has been announced by William I. Taber, chairman of the board of the Citizens Trust Company of Utica.

Reginald I. Heath, formerly with the British Royal Flying Corp. and an officer of the bank, will be the manager of the new company. Mr. Heath was the prime mover in the movement to obtain an airport for Utica and has been mentioned for the position of manager of the airport.

Mr. Heath has been appointed sales agent in Central New York for the Alexander Eaglerock plane.

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THEY are the best that money can buy.

Kantlinks give increased holding power. They do not rust, for they are Parkerized. They do not tangle or interlink.

Airplane manufacturers spare no expense in their determination to use the best materials available. Therefore, they, as well as the leading manufacturers in other industries, specify Kantlink. Although we emphasize quality first, in the long run Kantlinks *are* the most economical.

Samples for test will be sent upon request.

THE NATIONAL LOCK WASHER COMPANY
Newark, New Jersey, U. S. A.

Sales Offices:
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LOCK WASHERS

Three Friends "Tried and True"



Only one regret – that you didn't own them sooner!

You'll wonder how you ever managed to get along without this handy outfit when it becomes a part of your "personal" equipment. The three special pliers in the Aviator's Kit are designed *just for your work.* They enable you to do many difficult jobs in jig time, and with little effort instead of using time-wasting makeshifts.

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PLIERS

Guaranteed to Give the User 100% Satisfactory Service

The fine finish of these and ALL Vacuum Grip Pliers is an indication of their inward quality. "Good" steel *isn't good enough for us!* We use the best steel that can be produced by human ingenuity, special formula electric furnace tool steel, hammer forged and *hardened and tempered thru and thru*—NOT CASE HARDENED (surface hardened). That's why Vacuum Grip Pliers are still on the job, taking care of those tough daily jobs, long after ordinary pliers have been scrapped.

AVIATOR'S KIT

No. 67 (left)—The "Aviator"—Powerful grip and side cutters; thin nose; adjustable joint. Length 7". Price, $2.00.

No. 196 (center)—Needle nose, extra long reach; side wire cutters; spring tempered. A very useful tool. Length 6½". Price, $1.85.

No. 186 (right)—Diagonal Cutters; needed by every airplane mechanic. Length 6". Price, $1.90.

May be purchased separately if desired.

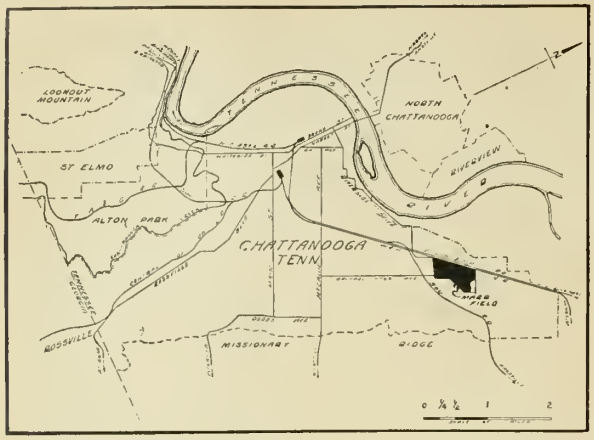
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Enclosed is Money Order for $5.75, for which you are to send me "Aviator's Kit" postpaid. (If individual pliers are wanted, use following form);
Send me Vacuum Grip No..... No.....
for which I enclose Money Order for $....
Name .....
Street .....
City ..... State .....
AD-7



Diagrams showing the location and arrangement of Marr Aviation Field at Chattanooga, Tennessee.

CHATTANOOGA NEWS

MARR FIELD, under the operation of the Tennessee Air Transport Co., Inc., has taken on the appearance of a real airport. A large gasoline tank has been installed, and the service nozzle is piped from it to a convenient point out in the field where a hose is boxed. Planes taxi up to this box, which offers no obstruction whatever to taxiing, and take on fuel.

The hangar accommodates four planes, and is surmounted with the regulation wind cone. The administration rooms are at one end of the hangar, the upstairs of which is arranged for the caretaker's apartments and emergency quarters for visiting airmen, though the city center is but four miles from the hangar. In the office are meteorological instruments, maps, flying information, telephone, and a bulletin board on which is posted a daily weather map, made direct from the long-wave transmission from Arlington, received at the field in code on a special receiving set. Pilot Eugene Fricks operates the set, the reports coming in at 9:30 a. m. C. T.

Visiting fliers contemplating a landing in Chattanooga are extended a welcome by the Tennessee Air Transport Co., who will do anything to make the fliers comfortable. Storage charges are moderate, $1 to $1.50 per day, and there are no landing charges. Gasoline is Government Specification, and the operators sacrifice the usual margin of profit because of the relatively high price of gasoline in this vicinity.

The field is in a general NE direction from the city, and from Lookout Mountain. Prevailing winds are SW winter and summer. The SW NE runway is 2,000 feet in length. In cross-winds light planes, and heavy planes having breaks, can land without difficulty, though until the cross runway has been completed a heavy plane without breaks would have difficulty if the wind blew directly across the field.

The company began operation of a passenger airline between Chattanooga and Atlanta on May 1st., operating daily except Saturday and Sunday. Round trip fare is $30, returning same day; one way, $17.50.

Besides the transport line, Tennessee Air Transport Co. operates a sight-seeing and commercial air service.

ALABAMA AIR NEWS

By Robert H. Brown

PASSENGER service between Birmingham and New Orleans on the air mail route running between Atlanta and New Orleans was started May 18 by the St. Tammany Gulf Airways Corporation, holders of the contract. Mail planes have been carrying passengers between Birmingham and Atlanta since the starting of the mail route.

THE Chicago Gulf Airways Corporation has filed a petition before the Alabama Public Service Commission to operate a passenger line between Mobile and Chicago. It is understood service will be started by early fall and that Ryan planes will be used. Stops will be made at Mobile, Montgomery, Birmingham, Nashville, Evansville, Ind., and others that have not been definitely decided on yet.



The markings on Marr Field, Chattanooga, are plainly visible from the air.

NEWS FROM ALABAMA

By Carlyle Ward

MAYNOR FIELD has been selected as the name of Tuscaloosa's new airport, in honor and memory of Eldridge W. Maynor, former University of Alabama student, who lost his life in the air service in France in 1918.

Governor Bibb Graves and Dr. George H. Denny, president of the University of Alabama, were among the prominent speakers at the dedication of the field.

Gordon Palmer, president of the Tuscaloosa Junior Chamber of Commerce, which sponsored the airport project, presided at the dedication.

BAYARD CARPENTER, pilot of the St. Tammany-Gulf Coast Airways, contractors for the New Orleans-Atlanta air mail service, has the distinction of having inaugurated use of Mobile's new airport, situated four miles from town off Cedar Point road.

Flying a Pitcairn Mailwing, Carpenter was the first aviator to land on the new field after it was placed in condition for service. It is now being utilized regularly by planes on the mail route, although its full development has not been completed.

MODERN developments in commercial aviation were discussed by A. O. Coons, president of the Chicago and Gulf Coast Airways of Mobile, in an address at a recent meeting of the Junior Chamber of Commerce of Mobile, where he was a special guest.

Keystone— a consistent user of HASKELITE

KEYSTONE Aircraft Company has used HASKELITE, the structural plywood, for a long time. They are today large consumers of this material. They say "plywood made with blood glue is superior to any casein plywood we have used. Blood albumen plywood is found especially good when subject to heat and moisture."

Naturally they stick to HASKELITE—the blood albumen glue plywood that meets every requirement of aircraft construction.

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Performance, Maneuverability and Maintenance — synonymous with "Keystone" in Aircraft circles — have indicated the "Pup" as the Training Plane of the future.

KEYSTONE AIRCRAFT CORPORATION
BRISTOL PENNA.

OHIO AIR NEWS

By T. E. Lunsford

COLUMBUS will open its airport around July 1st. The Commercial Airway Transit Corp., composed entirely of Columbus men, made the airport a reality. Officers of the organization are: Ross L. Harris, president; J. H. Walker, secretary and treasurer, and in addition to the officers, C. F. Rickets and A. J. Garbe compose the board of directors.

The airport equipment includes a 60 by 90-foot hangar, four hard-surfaced runways, each over one-half mile long. The field lighting equipment will be installed by Westinghouse, which includes flood lights, a rotating beacon and markers for the field. An intermediate air mail floodlight is being installed by the B. B. T. Corporation of America.

A MUNICIPAL airport is to be built in Canton. Councilmen John Burkhardt, E. J. Hopkins, and Ross Hurford have been named as a city committee to look after the matter.

TOLEDO'S new transcontinental airport was fittingly dedicated recently in the presence of more than 50,000 persons from that part of Ohio.

A CHARTER has been granted the Youngstown Aero Club, organized to promote and to stimulate interest in aviation. The club, which now has about 14 members, expects to purchase an airplane when the membership grows and will hire a pilot to teach members to fly.

Officers of the club are: Harry Weller, president; Orville Osgood, vice president; Harry McBride, secretary-treasurer, and Harry Brigham and C. A. Gustafson, publicity.

THE joint legislative committee on aviation, appointed by the last general assembly, on June 4 made the first of a series of airplane visits to Ohio cities when it took off from Wright Field, Dayton, for Middletown, Hamilton and Cincinnati, where it was entertained by the Cincinnati Chamber of Commerce.

Members who made the trip are: State Senators L. G. Collister, Cleveland; V. D. Emmons, Akron, and Miles S. Kuhns, Dayton, and State Representative David S. Ingalls, Cleveland, chairman of the committee; Earle L. Johnson, Painesville; Martin S. Dodd, Toledo, and Lloyd D. Bower, executive secretary of the committee. Mr. Bower is also secretary of the Commercial Aeronautics Committee of the Ohio Chamber of Commerce. A week will be spent by the committee later in the year in an aerial cruise which will cover Ohio.

THE Packard Electric Company of Warren, Ohio, manufacturers of airplane ignition cables, have purchased a Stinson-Detroiter monoplane, powered by a Wright J-5 engine to enable their executives to more quickly cover the country in meeting officials of their various wholesale connections. The plane is piloted by Lt. M. E. Headley.

QUEEN CITY Air Lines of Cincinnati plans a passenger line from Cincinnati to Cleveland, Detroit and Chicago.

Allen R. Joslin, Cincinnati capitalist and sportsman, organized the company which was incorporated by James R. Clark, Oscar F. Zimmer and William H. Hey. They will use Ford-Stout, three-motored, 14 passenger jobs on the route.

A NEW flying field has been opened at Lorain, on the southern limits of the city. Harbor City Flying Service operates the field.

The new field now consists of 20 acres but is to be enlarged to 90 acres by the end of summer.

FOREST J. McELROY, of Seville, O., was the first passenger to use the air-rail hookup of the Stout Air Services, Inc., in their Cleveland-Detroit airline.

McElroy flew to Cleveland from Detroit and then took an interurban to his home. Stout recently made arrangements with the Cleveland Southwestern railway to form the air-rail hookup.

STRESS analyses on the Simplex Aircraft Corporation's Red Arrow Simplex monoplanes have been approved by the Department of Commerce and they have been assigned numbers 43 and 44 covering the open two-place and closed two-place jobs.

THE Akron Aero Sales Co. has been incorporated by S. F. Fulton, operator of Fulton Field, Akron; J. Grant Hyde, president of the J. Grant Hyde Motor Co.; and P. P. Haupt, sales manager of the J. Grant Hyde Co.

CLEVELAND AIR NEWS

By David E. Irwin

JOHN ZAUNER, manager of the Ford Motor Co. hangar at Cleveland airport, has been appointed manager of the Thompson Aeronautical Corp. hangar now under construction at Kalamazoo, Mich., Richard C. "Tex" Marshall, president and general manager for Thompson, has announced.

Kalamazoo is to be a terminus of the Thompson company's new Bay City-Kalamazoo-Chicago air mail line.

The company has inaugurated a new tour by which Oberlin, O. college graduates can see their alma mater from the air in a five-place cabin job.

TWO new Wacos have been purchased by Dungan-Smith Airways of Cleveland, newest flying school and taxi service outfits. Harold E. Dungan is president of the company.

This company, which has built a hangar at Cleveland airport and will engage in instruction and taxi flights, has been named distributor for Ohio for the Fairchild Airplane Manufacturing Co.

TWO biplanes manufactured by the International Aircraft Corp. of Cincinnati are being shipped to Japan for service in the government air mail there.

The ships are powered with Curtiss OX6 motors with a top speed of 125 miles and a cruising speed of 100 m.p.h.

YVON MILRE, well known as a commercial pilot for a number of years has been appointed dealer for the Berliner Aircraft Company of Alexandria, Virginia. This company is producing the Berliner cantilever monoplane which has the Approved Type Certificate No. 39. Mr. Milre has sold his first plane to Mr. Demotte Modisette, president of The Modisette Realty Company of Cleveland. General commercial operations and a flying school is being conducted at Milre Field, Cleveland.

THE Continental Air Lines, Inc., contractor for the Cleveland-Louisville mail line, expect to get into operation during July. Flying fields at intermediate stops at Akron, Columbus, Dayton and Cincinnati are being put into shape. Lack of lighting facilities on the route, which is to be used exclusively for night flying, has delayed the opening.

Novel Free Gift for Aero Fans

We present a complete series of facsimiles of "The British Gazette" to every new annual subscriber to "The Aero Field." "The British Gazette," the only daily newspaper issued by the British Government, appeared for eight days only during the great general strike and all editions were largely distributed by aeroplanes. It is an unique souvenir, commemorating the value of aviation during an epoch-making crisis.

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This is just one of the many sizes and styles of Kocher Hangars. They are made to suit your requirements.

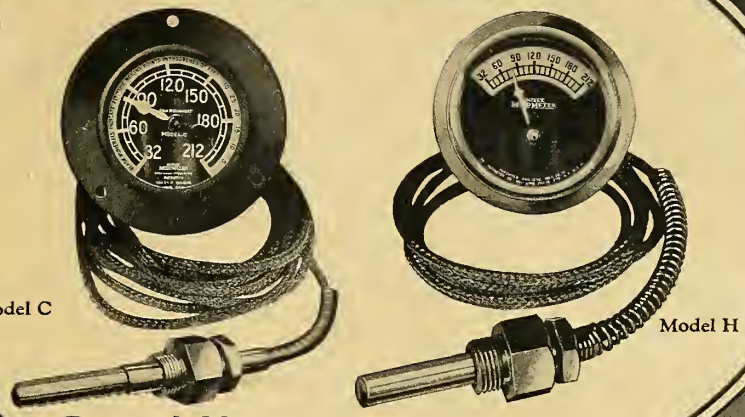
ALL Kocher Hangars easily constructed. Complete blue prints and instructions for assembly sent with every order. Kocher Hangars are sold at prices you can afford to pay.

Write today for complete information and prices. Yours for the asking.

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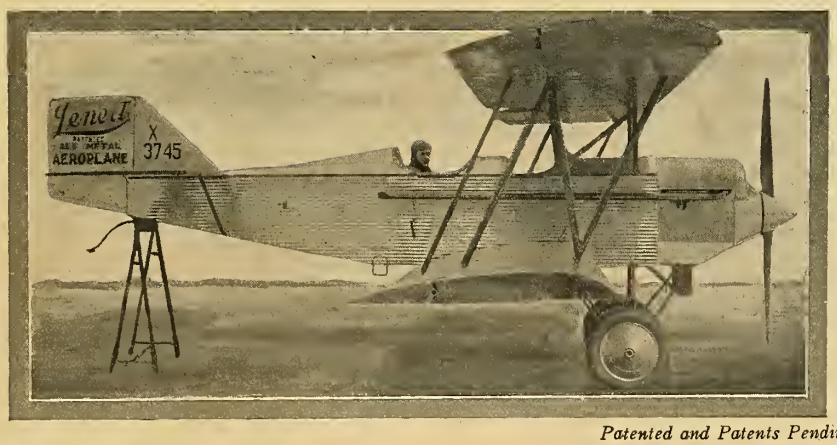


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Say you saw it in AERO DIGEST

TULSA AIR NEWS

By Shelton Lawrence

A TULSA-OKLAHOMA CITY airline will be opened soon, according to Paul Braniff of Oklahoma City, who has incorporated the Paul Braniff Air Transport Taxi Company at the capitol.

A hangar to accommodate 15 ships with pilots' rooms and a passenger waiting room is now being constructed at the Oklahoma City airport.

The company now operates a Stinson-Detroiter, a Ryan Brougham and two Travel Air ships.

AN Oklahoma airplane was chartered by the Associated Press to carry photo negatives from the Republican national convention at Kansas City to the telephoto machine at St. Louis to be sent to newspapers all over the United States.

The machine is the Lockheed monoplane belonging to Erle P. Halliburton of Duncan, Okla., which is considered one of the fastest planes in the state.

A HALF-MILLION dollar plant for the construction of the Spartan airplanes will be built at the northeast edge of Tulsa by the Spartan Aircraft Co.

Thirty acres, comprising six blocks of the new Mohawk Ridge addition, have been purchased for the site. Construction in charge of the Austin Co. of Cleveland, Ohio, is to get under way immediately as, under the contract, the plant is to be finished in 45 days. The structure will be 135 feet wide and 300 feet long.

The new factory running at regular capacity will employ 300 people. The present plant at 915 N. Wheeling Avenue, operates with 50 employees.

Production is anticipated to run around five completed Spartans a day. Present production averages three a week.

Officials of the Spartan company are Willis C. Brown, president; W. G. Skelly, chairman of the board of directors; F. T. Hopp, secretary and treasurer, and A. K. Longren, vice president in charge of production.

C. C. Herndon, vice president of the Skelly Oil company, and director of the Spartan company, recently toured Europe, accompanied by Brown with a view to obtaining new ideas and information on the manufacture of airplanes.

FORTY-TWO members of the underwriting syndicate of the proposed municipal airport northeast of Dawson, Okla., were announced recently by C. S. Avery, chairman of a committee from the Tulsa chamber of commerce in charge of the underwriting campaign.

The members are as follows: W. G. Skelly, Skelly Oil Co.; C. C. Herndon, Skelly Oil Co.; C. H. Terwillinger, realtor, John D. Mayo, Mayo Hotel; C. A. Mayo, May Furniture Co.; H. R. Ketchum, Tulsa Hotel; K. M. Vaughn, Vaughn Lumber Co.; James H. Gardner, Gardner Petroleum Co.; Cyrus S. Avery, realtor; N. R. Graham, Exchange National Bank; L. E. Abbott, Halliburton-Abbott Co.; H. C. Tyrrell, oil producer; C. C. Cole, oil man, Hunter L. Martin, Pearce Porter and Martin Insurance Co.

H. O. McClure, Charles F. Noble, W. M. Bovaird, A. E. Bradshaw, H. C. Brockman, J. D. Foster, J. A. Frates, Ralph Talbot, Lee Chilton, G. R. McCullough, Waite Phillips, Omar K. Benedict, Henry Dreyfus, E. P. Harwell, R. F. Garland, E. H. Moore, Col. P. J. Hurley, Harry H. Rogers, John Dunkin, R. C. Sharp, R. P. Brewer, D. D. Wertzberger, W. L. Kistler, J. C. Halliburton, A. L. Farmer, W. A. Vandever, Major John W. Leavell and Fred W. Insull.

The amount underwriten was $310,000 for the purchase of 400 acres of land. A part of the money is to be used for equipping the port.

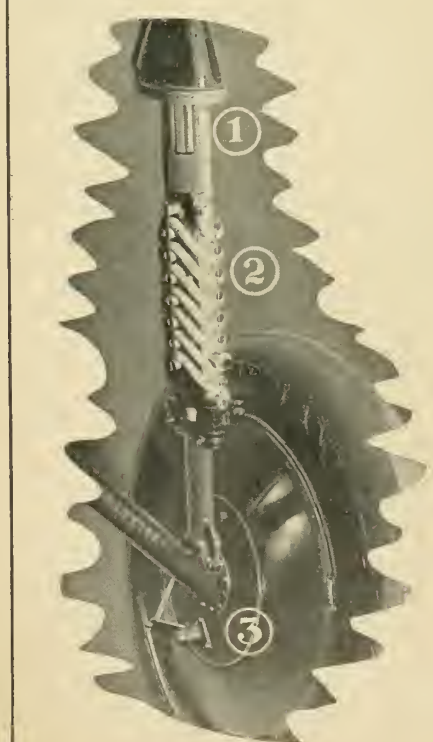
OKLAHOMA STATE NEWS

By Ernest W. Fair

THREE large airplane transportation companies have been organized in Oklahoma City recently. The Oklahoma Air Transport Co. has moved from Norman and organized into a state wide air service using Oklahoma City as its hub. A 12-plane hangar has been started and the schools of the company, formerly at Norman, have been moved to Oklahoma City. They are under the direction of Jimmy Haizlip, chief pilot. Roy O. Hunt is vice president and B. S. Graham, president.

THE second company is the Paul Braniff Air Transportation Co. A 14-plane hangar has been completed and service has already been started on an Oklahoma City-Tulsa daily passenger and transportation service,

(*Continued on next page*)



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One of these ships has been in service since early in 1925, while another has been in service equally as long and has covered upwards of 200,000 miles on air mail and cross country flights and under all kinds of weather conditions, winter and summer.

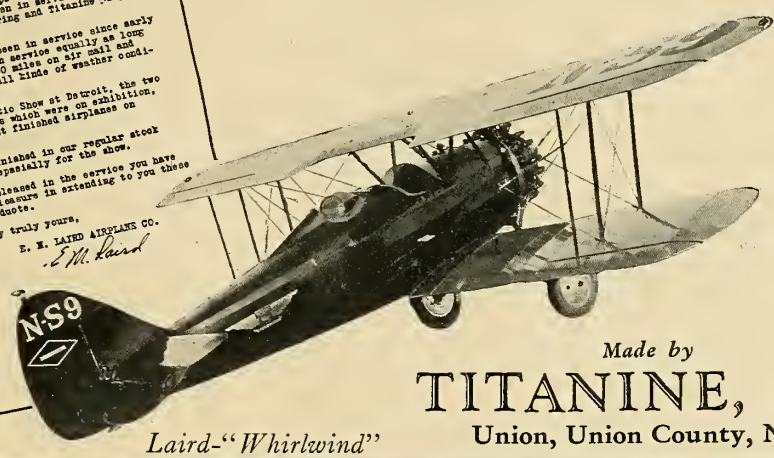
At the recent Aeronautic Show at Detroit, the two Laird-Whirlwind commercial planes which were on exhibition, were regarded by all as the best finished airplanes on exhibition.

These planes were finished in our regular stock color and were not finished especially for the show.

We were more than pleased in the service you have been rendering us and take pleasure in extending to you these few words regarding your products.

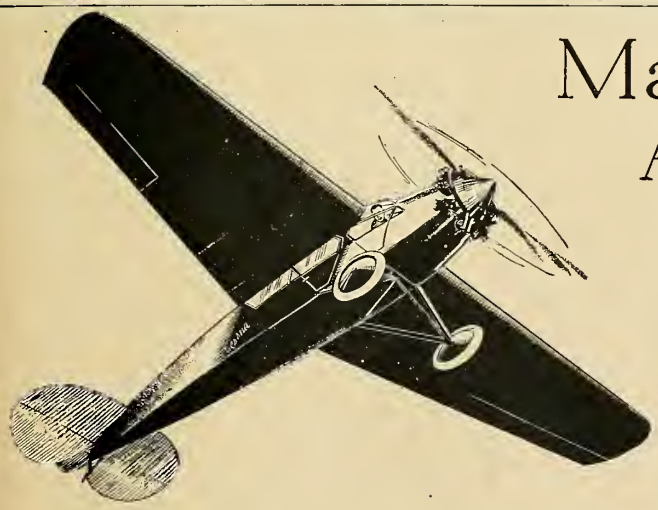
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Cessna Cantilever Cabin Monoplanes have proved their right to the name. More than doubling the safety factor required by the Government, in staunchness and air-worthiness, they have no equal.

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In prices too, they are unequalled. Powered with the 200 H. P. Wright Whirlwind, this 4-place cantilever cabin plane sells complete, with brakes, air-speed indicator and other necessary equipment, at $9800; with the 10-cylinder Anzani, converted by our own engineers, for $5750.00, both prices fly-away Wichita.

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Cessna Aircraft Company

Wichita, Kansas

using cabin planes, a Ryan and a Stinson. F. C. Hall, Powell Briscoe, E. E. Westervelt, Ray H. Smiser, W. A. Lybrand, T. E. Braniff and Paul Braniff are the incorporators of the company. Flying schools have been set up by the company at Tulsa, Chickasha and Oklahoma City and others are being planned. Paul Braniff is president; T. C. Hall, vice president; Lybrand, secretary and Westervelt is treasurer.

THE third Oklahoma City firm is the Air Service Corporation, of which H. W. Parker is the head. They are operating four ships to all points of the state and are offering any kind of air transportation service desired.

THE organization of the Petroleum Air Lines to run from Tulsa and Bartlesville, Oklahoma, through Oklahoma City to San Angelo, Texas, is nearing completion. The board of directors is now busy buying equipment for the company.

THE steel hangar just erected by the Butler Manufacturing Company of Kansas City, Mo., and Minneapolis for the Halliburton Oil Well Cementing Company, at Duncan, Oklahoma, is another indication of the progressive spirit of the oil industry. As a whole, oil men have taken readily to the use of the airplane and the allied trades are following right in line. With its airplane, capable of a speed of 135 miles an hour, the Halliburton Company can help the oil industry to save money in its drilling operations by its quick service.

ARKANSAS AIR NEWS

By Dwight E. Wilkerson

A RECENT survey of several business houses and banks in Little Rock showed that the city is greatly in need of an air mail route through here, and that the business men and banks are ready to stand back of any efforts to establish a line through here. The reports of the survey will be sent to the postmaster-general, and request for authorization for the line will be made. A recent conference was held at Tulsa, Okla., attended by officials of many leading lines, and the proposed line from Memphis, through Little Rock, Muskogee and Tulsa, and from there on west was discussed but no definite plans were made.

THE conference at Tulsa was attended by Lieut. Wright Vermilya, of the local 154th Observation Squadron, Arkansas National Guard, and Charles Taylor, of the Union Trust Bank, of Little Rock. They made the trip by plane, dropping details of the "Paint Your Town" week which was proclaimed throughout Arkansas. The idea is to induce each town to paint its name on top of the tallest building in town, so that all who fly may see.

THE Arkansas Airport Co. has been organized at Pine Bluff, Ark., with a capitalization of $500,000. The company will be headed by L. Garrett, secretary of the Arkansas Power and Light Co., with Felix Smart, Southwest District Governor of the N. A. A., vice president.

It was decided to name the Pine Bluff airport Toney field, in honor of Pine Bluff's mayor, who was active in securing the field. The new company will purchase an additional 124 acres of ground adjoining the present field, which will bring the total acreage to 224, 50 acres of which will be set off for the locating of airplane factories, training schools and other aircraft industries.

Frank Allen, Pine Bluff City Engineer, was appointed chief engineer of the new company.

"Mark Your Town Week"

"MARK Your Town Week" for Arkansas, June 10-16, sponsored by the Arkansas Real Estate Association and proclaimed by the Governor, was a huge success. On the fifth day of this movement 45 towns had reported that the work of marking the name of the town on the roofs for the benefit of fliers had been started.

Mayors of the towns throughout the state received letters signed by the president of the State Mayors' Association, and the presidents of the Chambers of Commerce received letters signed by the president of the Little Rock Chamber of Commerce, both accompanied by a letter of the plan urging these individuals to see that their town was properly marked during the week. Some 250 of these letters were dropped from airplanes and attracted unusual attention.

SEAMLESS STEEL TUBING

All Aircraft Grades

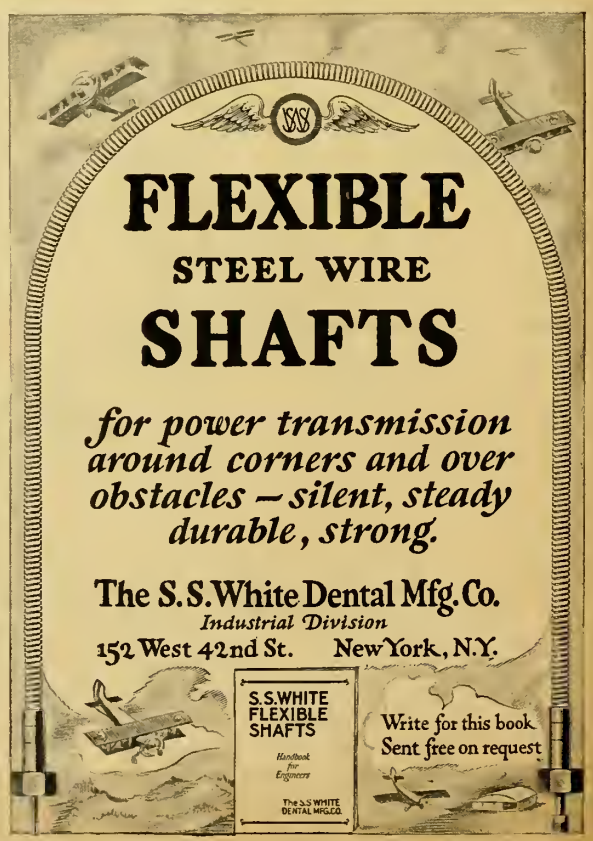
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CONFIDENCE



IN anything one may undertake, nothing will help toward success any more than confidence.

This is especially true of flying. A "real" pilot must have confidence in his ship . . . his motor . . . HIMSELF.

Such confidence is born of knowledge—knowledge of what to do . . . WHEN . . . WHERE . . . HOW . . . WHY. To be a "real" pilot one must know airplanes, motors, navigation, meteorology—all the "million and one" phases of flight.

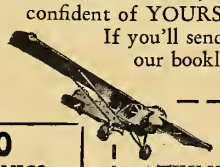
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"MOTH" PRODUCTION

THE Moth Aircraft Corporation, formation of which for the manufacture in this country of DeHavilland "Moth" light airplanes was announced in last month's issue of AERO DIGEST, has taken offices in the Graybar Building, Lexington Avenue and 43rd Street, New York City. It is now in the final stage of negotiations for a factory site in the East and has mapped out a program which calls for several assembly and distribution plants covering all parts of the United States.

The license under which the "Moth" is to be built in the United States makes all new improvements, refinements, etc., available here at the same time they are incorporated in English-built "Moths". The first planes produced by the American company thus will have the new split-axle type landing gear, steerable tail skid and adjustable stabilizer which are standard equipment on the new "Moth" as well as the new DeHavilland "Gypsy" engine of 100 horsepower which gives the plane a high speed of 108 miles an hour and a climb of 900 to 950 feet a minute as compared to 98 miles an hour and 500 feet a minute climb with the Cirrus Mark II engine formerly used in the "Moth".

The new DeHavilland engine is a vertical four-cylinder-in-line air-cooled direct drive power plant with a bore of 4½ inches and a stroke of 5⅛. It has a compression ratio of five to one, a displacement of 5,226 cubic centimeters and develops 100 horsepower at 2,100 r.p.m. or 88/90 at 1,900. Its gasoline consumption is .58 pints per b.h.p. per hour and its oil consumption .7 pints per hour. The engine weighs 285 pounds complete with integral hand turning gear, airscrew boss, etc. It has two magnetos and double ignition and in the Tiger Moth racing plane, for which it was developed, it ran over long periods at 2,700 r.p.m., turning up 130 b.h.p. with no hint of trouble and with utter reliability.

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BERRY BROTHERS, INC., has developed a group of finishing "commandments" for eliminating fire hazard in airplane plants.

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Posted about the plant, the rules will serve as a constant reminder of necessary precautions which will practically eliminate fire hazard. Copies of the poster have been mailed to manufacturers and additional copies will be sent on request.

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BOEING ORDERS 105 P & W "HORNETS"

THE Boeing Airplane Company of Seattle, Washington, on June 6th placed an order for 105 Pratt & Whitney 500 horsepower "Hornet" engines and ten 400 horsepower "Wasp" engines, all of the air-cooled radial type. These negotiations were concluded in Hartford by Mr. P. G. Johnson, president of the Boeing Airplane Company, and Mr. Edward Hubbard, operations manager of the Boeing Air Transport Company.

Since July 1st, 1927, Boeing Air Transport have operated the transcontinental air mail from Chicago to San Francisco, using Boeing mail ships, equipped with Pratt & Whitney "Wasp" and "Hornet" engines. A short time ago Boeing took over the Pacific Air Transport, which operates the mail and passenger route from Los Angeles to Seattle. Still further extensions are being planned by Boeing Air Transport. They are now operating about 6,000 miles daily and it is expected this will be increased to approximately 8,000 miles in the near future.

The monetary value of the engines just purchased from the Pratt & Whitney Aircraft Company is approximately $1,000,000 and constitutes the largest order for commercial equipment on record. While some of the additional engines will be placed in single-engined mail ships a number of the "Hornet" engines will be used in giant trimotor air liners, capable of carrying twelve passengers, with baggage, a thousand pounds of mail or express, together with two pilots. These air liners are primarily for passenger carrying between Chicago and San Francisco but will also be used in connection with some of the plans for new routes.

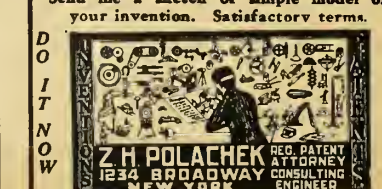
INSURANCE PREMIUMS REDUCED

FORTY to fifty per cent reduction in the extra premium heretofore added to the regular premium on life policies to cover the flying hazard has been announced by Barber & Baldwin, Inc., aviation insurance underwriters.

This action was taken after a careful review of the life insurance situation. Heretofore, the premium rate for pilots and passengers on aircraft has been from ten to forty dollars per thousand to cover the flying part of the hazard. This charge was added to the regular premium on the policy. This extra premium has now been reduced and will range from five to twenty-five dollars per thousand.

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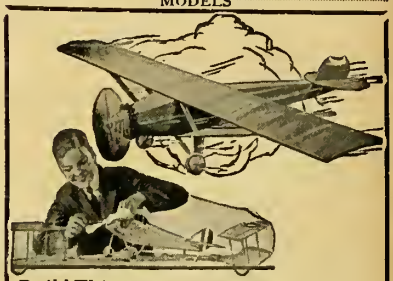
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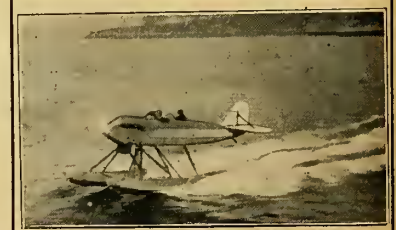
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FLORIDA AIR NEWS

By Johnson Wright

THE Coral Gables Aviation Society has disbanded and the formation of Coral Gables Division, Greater Miami Airport Association has been effected by officials of the two organizations. C. H. Reemelin, president, and C. B. Ehrmann, secretary, were added to the directorate of the G. M. A. A. More than $100 remaining in the treasury of the society was given to the University of Miami towards a fund for starting a course in aviation.

THE Chalk School of Aviation with headquarters and base on the causeway between Miami and Miami Beach has an enviable record for safe flying. Established in 1919, it has operated constantly ever since without having suffered any accidents. A Waco-9 on Edo pontoons is now being used and is proving very satisfactory. A Swallow, powered with a 150 h.p. Hisso A, will be added during the coming fall. A. B. Chalk is the proprietor of the school and at present is doing most of the flying.

A COLORFUL event during the evening of May 24th was the installation banquet of the Florida Chapter of the Kappa Gamma Delta Aeronautical Fraternity at the University of Florida at Gainesville.

Among the honorary members elected who have rendered considerable assistance to the new fraternity were: John T. Robertson, New Smyrna; Harry Rogers, Miami; A. B. McMullen, Tampa; and Judge Daniel Simmons, Jacksonville.

CAL LATHAM is in charge of the Miami base of the Rogers Air Lines again this summer.

THE Potomac Flying Service, Inc., of Washington, D. C., have taken over the Biscayne Flyers, Inc., of which Eddie Niramier was president. The flying equipment, consisting of two Curtiss Seagulls, has been taken to Washington where they will be operated this summer from Arlington Beach.

The Biscayne Flyers have operated here for over two years.

GLENN H. CURTISS a pioneer in aviation, donated to the city of Miami 160 acres for a permanent municipal airport. The city has accepted the generous gift and will expend $25,000 in the next two years in providing proper facilities to meet the ever growing demands of aviation.

This tract has been in use as a temporary landing field and an administration building.

Besides the two air mail lines, the Curtiss school of pilot instruction will use the field. Free use of the field as an airport will be afforded the military service of the United States and the various states.

THE Department of Aviation, City of Miami, secured on June 11th an appropriation of $2,500 for sodding the runways of the Municipal Airport, Gratigny and LeJeune Roads.

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AEROMARINE-KLEMM COMPANY FORMED

THE Aeromarine-Klemm Company has acquired the American manufacturing rights to the German Klemm-Daimler light sport plane and will start production late this summer.

The Klemm plane was designed by Dr. Hanns Klemm of Sindelfingen in 1919, who who will be associated with the new company. With a 20-horsepower Mercedes engine it can make forty miles to the gallon of gasoline at an average speed of 60 m.p.h.

The Aeromarine-Klemm company will use the factory of the old Aeromarine company at Keyport, N. J., and will build its own engines.

The Klemm is a monoplane with an underhung cantilever wing. Its dimensions are: span, 42 feet; length over all, 23 feet; weight empty, 583 pounds; useful load, 407 pounds; seats two, dual control, ceiling with full load, 12,600 feet; landing speed, full load, 28 m.p.h. The wings are detachable for storing.

The company was formed by Mr. Inglis M. Uppercu.

INDIANA AIR NEWS

By Robert Kellum

INDIANAPOLIS, first stop on the Ford Reliability tour, starting at Detroit, has made preparations for the reception of the tour planes. George M. Williams, president of the Marmon Motor Car Company, is city sponsor and T. E. Myers, general manager of the Indianapolis Speedway, was named field referee. The landing field is the speedway. The reception committee includes: H. H. Brooks, Marmon sales director; Norman A. Perry, R. V. Law, Elmer W. Stout, Paul Ritchie, Irving Lemaux, Wallace O. Lee, W. A. Atkins, Harper Ranburg, Homer McKee, H. M. Glossbrenner, E. S. Gorrell, Roy Adams, F. E. Schortemeier, secretary of state, Joseph H. McDuffee, E. J. Rork, Lieut. Walter R. Peck, Major R. F. Taylor, Earl Cooper, Capt. Oliver Stout, Capt. H. Weir Cook, Lieut. Matt Carpenter, Robert Shank and H. C. Brooks. Postmaster Robert Bryson, Meredith Nicholson and Mayor L. Ert Slack were designated field judges with Odis A. Porter in charge of timing.

J. H. Armington, U. S. Meteorologist, has made arrangements for the providing of complete weather reports to air men in the district.



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FOREIGN AERONAUTICAL NEWS IN BRIEF

Compiled from the foreign aeronautical press, the Automotive Division and the Transportation Division, Bureau of Foreign and Domestic Commerce

CANADA

Canadian Air News

By James Montagnes

THE DeHavilland plant at Toronto, which is now producing Moth planes, is at Mount Dennis, eight miles from the center of the city.

The factory is housed in the hangar, which has a capacity for housing twelve Moths with wings folded. The machines are only assembled here, being flown and thoroughly tested in England, before they are dismantled for shipment.

THERE is a shortage of flying club instructors, due to the many clubs springing up. The DeHavilland property is being used to train these instructors, most of them having flown during the war.

LONDON, Ontario, has now been added to the air service from Rimouski, Que. An express service operated by the London Airways, makes a specialty of fast delivery on parcels sent from London, England, for London, Ont. It is run in the connection with the Canadian Pacific Air Express packet service which meets all incoming European liners at Rimouski, Que.

News from Canada

By C. P. C. Downman

THE first award of the McKee trophy for "meritorious service in aviation" was made on June 15th by Col. the Hon. J. L. Ralston, Minister of National Defense, to Capt. H. A. Oaks, of the Northern Aerials Minerals Exploration, Ltd. The trophy, donated by the late J. Dalziel McKee, the Pittsburgh millionaire aviation enthusiast who was killed in a crash in the Laurentians last summer, will be an annual award, the recipient each year having his name inscribed on it. A replica of it will be given to the winner as his own possession.

NINE airplanes bringing messages of goodwill from the United States swooped down on Stevenson Field, the new aerodrome of the Winnipeg Flying Club, recently, to participate in an air pageant conducted in connection with the official opening of the club.

Led by "Speed" Holman, holder of the world's loop-the-loop record, the fliers soared low over the city in reconnaissance formation and landed gracefully on the field.

Among the United States visitors were G. A. Youngquist, Attorney-General of Minnesota; Lieut.-Col. R. A. Roseberg and Lieut.-Col. J. E. Nelson, of the Minnesota National Guard; C. J. Johnston city editor of the St. Paul *Pioneer-Dispatch;* Major Ray Miller, of the 109th United States Aero Squadron, and a squadron of army pursuit pilots.

GRANBY, Que., now has a light airplane club with 90 flying members and 120 associate members, and has received its two Moth machines from the Government. On June 16th the town held an air pageant to celebrate officially the birth of the club. Known officially as the Granby Aero Club, Inc., it draws members from the cities of Sherbrooke, Cowansville, St. Hyacinthe and Magog.

Joseph Gregoire is president of the Granby Aero Club and Captain Carl Stohn is vice president. Captain P. Horace Boivin is secretary and the directors are Colonel J. Bruce Payne, Jim Fuller, Albert Sauvage, Emile Isabelle, Bob McDonald, Jacques Cartier and Captain Frank S. McGill, the two latter being directors of the Montreal Light Aeroplane Club.

Captain F. N. Hase, of St. John, N. B., has been appointed chief instructor.

British Columbia News

By A. F. Roberts

THREE commercial aviation firms are operating in British Columbia this summer. The largest is Western Canada Airways, Ltd., of Winnipeg, which bought out Pacific Airways, Ltd., of Vancouver, taking over its fisheries patrol contract with the Dominion government. It has two BD1 flying boats built by Boeing in Seattle and two Hs2L flying boats which were the property of the Vancouver company before the merger. Major D. R. MacLaren is B. C. manager for the firm. In addition to the patrol the company is doing taxi, photographic and timber reconnaissance work out of Vancouver.

The Dominion Airways, Ltd., of Vancouver has two D.H. Moths, one of which has been fitted with skis and is being employed in forestry patrol of the interior out of Nelson. Capt. L. A. Dobbin is the pilot in charge of the patrol.

The third company is the B. C. Airways, Ltd., of Victoria, which has an Eaglerock two-seater for training purposes and a Driggs Dart for private flying. It has a large class of students in training for pilots' licenses and is doing taxi work and odd jobs.

Both Western Canada Airways and B. C. Airways are planning to establish a triangle passenger and mail service to connect Vancouver, Victoria and Seattle. The former plans to use Fokker Super-Universals such as it has in service in Manitoba while the latter has announced that it will have a trimotored Ford-Stout plane on the run.

ENGLAND

THREE new world's air speed records have been won by Great Britain.

Flying a De Havilland "Hound" fitted with one of the latest type 450 h.p. Napier "Lion" engines, weighted with 1,000 kilograms of ballast (2210 lbs.), Captain H. S. Broad, on April 27th, covered 100 kilometers at an average speed of 162.292 m.p.h. and 500 kilometers at an average speed of 158,663 m.p.h. The previous record over a 100-kilometer course was held by M. Lasne (France) who on October 16, 1925, flying a Nieuport-Delage 42C-I (500 h.p. Hispano-Suiza engine) made an average speed of 153.130 m.p.h. The previous record over 500 kilometers was held by M. Jezek (Czechoslovakia) who on October 13, 1927, covered the distance at a speed of 143.492 m.p.h. on a Letov S. 16 (450 h.p. Hispano-Suiza engine).

The D. H. "Hound" was designed as a two-seater general purpose biplane. For the record-breaking flights, the back gun-mounting and covering in the back cockpit and the front gun position were removed. The 1,000 kilogram load was carried in the form of lead ballast, exclusive of gasoline, oil and pilot, which weighed 1,950 pounds. The "Hound" weighed 6,500 pounds fully loaded.

AS AERO DIGEST goes to press we learn that General Umberto Nobile and one of his crew have been rescued from their perilous situation, by a young Swedish airman, Capt. Tornberg, of the Swedish rescue expedition. This has been of international interest for Italy, Russia, Norway, Sweden and France have for many weeks been advancing every effort to rescue General Nobile and his crew from the north arctic floes where they have been stranded since May 25 when they were forced to descend in the *Italia.* The Swedish expedition hopes to rescue the remainder of the crew as soon as possible. General Nobile's experiences will be reported in detail in the August issue of AERO DIGEST.

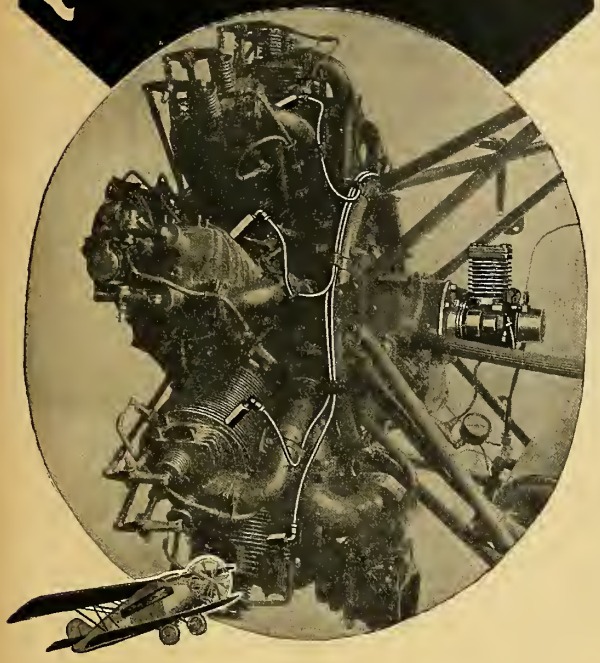
ITALY

World's Endurance Record

THE world's endurance record has been gained by two Italian airmen, Capt. Arturo Ferrarin and Major Carlo del Prete. Flying over a closed course from Montecello Field, Rome, on June 2, Ferrarin and Prete stayed in the air 58 hours and 37 minutes thus eclipsing by 5 hours the record held by the American fliers, Eddie Stinson and George Haldeman, who had held the world duration title since March. It is also estimated that they covered a distance of 4,300 miles which is a distance record over a triangular course.

The record was made with a large monoplane, a Savoia Marchetti S-64, with a wing spread of about 65 feet. It is equipped with a 12 cylinder water-cooled Fiat engine, A 22, which develops 550 h.p. at 1900 r.p.m. The engine is carried high above the wings and has a special regulating device attached which limits the gasoline consumption to a minimum.

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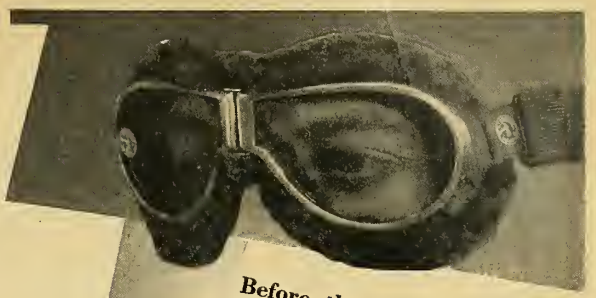
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CROYDON—THE AIRPORT OF LONDON

THE principal British airport, the Air Port of London, Croydon, is a State-owned aerodrome covering nearly 400 acres, under the direction of the Director of Civil Aviation. It possesses a fully-equipped customs clearance station where customs officers are in constant attendance to clear outgoing and incoming aircraft, passengers and goods. An immigration office, through which all aliens must pass, is attached to the customs office.

On the aerodrome a hotel has been established for the convenience of passengers and pilots, and a special enclosure from which the flying can be viewed is available for the public.

The airport is under the immediate control of a civil aviation traffic officer who is assisted by four traffic officers, A.I.D. inspectors, and by wireless, meteorological and other staff.

Arrangements for the lighting of the aerodrome, for the supply of meteorological information and for wireless communication with machines in flight have been brought up to date by the introduction of the latest improvements.

In the booking hall of the administration building a notice board gives details of the times of arrival and departure, and of the place of departure and destination of all airplanes engaged in air services.

A medical orderly is continuously on duty in a fully equipped first aid dressing station, and the services of a medical practitioner are available at short notice.

Letters, telegrams, etc., may be despatched from the post office situated in the booking hall. Public telephones are also available. A buffet is also installed here, and large weather maps of Europe are on the wall.

The old headquarter buildings were temporary structures of war-time construction not well adapted to the needs of a civil airport, and their removal allowed an entire reorganization in the layout of the aerodrome. The landing area has been made larger and capable of carrying a heavier volume of traffic with safety.

The new buildings, built by the Air Ministry at a cost of £267,000 and officially opened on May 2nd by Lady Maude Hoare, the wife of the Secretary of State for Air, are capable of meeting the needs of the airport for some years. The runways from east to west are 1,450 yards, and from north to south, 1,300 yards. Among the new buildings are two large hangars, each with two bays, with a total floor space of 90,000 square feet for aircraft; 36,000 square feet for offices, workshops, etc., adjoin the hangars. Three bays of a permanent hangar in the old aircraft factory, recently occupied by A.D.C. Aircraft, Ltd., are also available. Behind these hangars are up-to-date workshops and repair sheds.



The administration building at Croyden, showing the central control tower.

Administration Building

In the administration building accommodation has been provided for the airport control staff, booking offices, customs and immigration authorities, waiting rooms, and booking hall, immigration examination halls and freight stores. The building is of two-story construction, with a 50-foot high control tower placed centrally to afford a clear view over the aerodrome.

Central Control Room

The control tower rises two stories above the level of the remainder of the administrative buildings to a total height of about 50 feet and is surmounted by the wireless direction finding aerials. The top story of the tower forms the control room, from which control of aerial traffic on the air route is carried out.

The control room, which is 30 feet square, is provided with windows on all sides in order to give an unimpeded view of the aerodrome, and is partitioned off internally by means of a glass screen to form two distinct offices, an outer traffic officer's office, and an inner wireless office; it is also encircled by a balcony, on which the look-out man takes up his post.

A traffic officer, who is present at all times of the day and night, is in charge of the control room. He is stationed in the outer office, which faces the aerodrome, and is in communication with aircraft on the routes through the medium of the wireless operators; he is in communication with the aircraft operating companies and other aerodrome officials by means of the telephone; he is in communication with the meteorological office (from which he receives hourly reports stating the weather conditions at various points along the routes) by means of a pneumatic tube; he is in communication with the duty office (which deals with all messages concerning the arrival, departure, etc., of aircraft along the routes), by means of the pneumatic tube; he controls the landing and taking off of aircraft by means of visual signals (colored metal discs, Very lights, rockets, etc); and he has under his control, by means of switches, the aerodrome obstruction lights and Neon beacon. He has in front of him a map of the sectors of the routes for which he is responsible, and near him a table for charts; the map is painted on thin sheet steel, and is provided with magnetic arrows, each of which represents an aircraft, and which is moved across the map in accordance with information as to the position of the aircraft obtained either by means of messages from the pilot, or as the result of observations taken by the wireless direction finding service.

Two wireless operators stationed in the inner office, together with the direction finding receiver, transmitter controls, direction finding chart, etc., provide the means whereby messages between the traffic officer and the pilot of an aircraft, and vice versa, can be passed, and whereby the position of his aircraft may be ascertained and passed to the pilot.

Night Flying Lights

The lighting of the aerodrome for night flying or for assisting pilots to land safely in foggy weather has been the subject of careful experiment and research for several years, and the system in use at Croydon is still in the development stage. It comprises:

Landing lights sunk in the aerodrome to indicate the direction of landing. Two L's back to back are outlined in lights on the landing area in a direction determined by the prevailing wind. In the event of a change of wind the lights can be altered immediately from the control tower to conform with its new direction.

Neon beacon—This light consists of a number of tubes of neon gas which, when illuminated by the passage of an electric current, glow with a brilliant red hue that is particularly valuable for penetrating fog. This light has a flashing character.

Floodlight—A special form of floodlight projecting a beam over an arc of 180 degrees is used to illuminate the surface of the aerodrome at night. It is mounted on a specially designed motor-chassis.

Obstruction lights and boundary lights—The obstruction lights which are placed on all obstacles around the aerodrome are fixed red lights, and the boundary lights which indicate the extent of the landing area are flashing red lights. The latter are automatic in action and function continuously by day and night. (*Continued on page* 170)

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Pyrotechnic signals—Rockets and Very lights are fired to signal to aircraft in accordance with the International Air Convention.

Compass Swinging Base

The latest type of compass swinging base has been installed on the aerodrome to facilitate the correction of compasses.

Meteorological Office

The meteorological office is situated in the main building immediately beneath the control room. Weather reports are received hourly from stations in S. E. England, France, Belgium, Holland, and Western Germany, situated on or near the main air routes. Reports for two consecutive hours are also displayed on two large maps of N. W. Europe in the entrance hall on the main building. In addition to the regular hourly reports, special intermediate reports are received when sudden changes in weather conditions which are likely to affect aircraft, occur at any station.

A forecast is obtained by telephone from the meteorological office, Air Ministry, for each service leaving Croydon, and advice as to existing and probable weather conditions along the air routes is given personally to pilots by the meteorologist-in-charge.

Special weather reports and forecasts to cover other routes are also issued on demand.

Radio-Telegraphic, Radio-Telephonic and Direction Finding Services

The following wireless services are provided to serve international air routes terminating in Great Britain:

Radio-telegraphic and radio-telephonic services for communication with aircraft in flight. These services are maintained from one hour before sunrise until one hour after sunset daily, and by their means pilots of aircraft are kept informed of weather conditions, can report their positions to the route controlling authorities, and can in general keep in touch with these authorities.

Radio-telegraphic service to route aerodromes. By means of this service, arrivals of aircraft at, or departures from, aerodromes, forced landings between aerodromes, etc., are notified to the aerodrome authorities concerned.

Radio-telegraphic service for the collection and distribution of meteorological information.

Wireless direction finding service. The direction finding services in the countries represented at the International Civil Aviation Conferences have now been so coordinated as to allow of an aircraft flying along any sector of any recognized air route in these countries to obtain either its position as determined by two or more direction finding stations, or to obtain its bearing from any one particular direction finding station.

At the Air Port of London, reception alone for the wireless service is carried out in the Administration Building at the aerodrome, all transmission being effected by means of remote control, from a transmitting station situated on the edge of Mitcham Common, at a distance of about three miles from the aerodrome.

GERMANY

German and Austrian Air Services

By Dr. Carl Hanns Pollog

DURING the summer months of this year Germany again will be covered by a net of airways with extensions to other countries. Special attention is given by the managers of the German aviation company, Deutsche Luft Hansa A. G. (D. L. H.) to the international routes and to airlines to famous spas and health resorts. All the excellent connections between Berlin and the leading cities of other European countries (Amsterdam, London, Brussels, Paris, Zurich, Vienna, Prague, Riga, Moscow, Stockholm, Kopenhagen, Oslo, Budapest, Helsingfors to be reached in one day; Madrid, Rome, Belgrade, Sofia, Bukarest in two and Constantinople in three days) have been maintained and the time tables of several of them have been improved. For example the starting time of the only European passenger-carrying night service, Berlin-Danzig-Königsberg and on to Riga-Moscow (of which, by the way, the transatlantic pilot, Captain Hermann Köhl was in charge) has been altered from 3 a. m. to 11 p. m. Thus the passengers arriving from the west and south of Germany and from England, Belgium, Holland and France during the afternoon may enjoy at least part of their night's rest in the plane—till they are roused at Königsberg at 4 a. m. for the passport and customs revision. The ship arrives at Khodynka Field, Moscow, at 3 p. m. This line is run by the Deruluft, Deutsch-Russische Luftverkehrs A.-G., in coöperation with D. L. H., and a connection to Leningrad by way of Reval as well as a service from Reval to Helsingfors, Finland, by a Finnish company will be in operation soon. By using the Swedish line to Stockholm and the German route to Berlin one may circle the whole Baltic Sea in two days, a very interesting and enjoyable trip.

A special feature of the D. L. H.'s summer time table are several long hops. The intermediate landing at Essen on the route from Berlin to Paris has been cancelled, the plane stopping only at Cologne. On Sundays the whole distance Berlin-Paris (552 miles) is covered in one hop. Between Berlin and a number of large cities two or three daily connections are provided, the one direct and the other with intermediate landings, for example Berlin-Cologne (300 miles), Berlin-Frankfurt (267 miles), and Berlin-Zurich (422 miles). The time gained in the latter case on the direct route amounts to 1½ hours. A similar through route with connection to Venice is proposed between Berlin and Vienna.

An experimental trans-Alpine route will be opened soon between Munich and Milano. The crossing of the Alps is somewhat difficult, as the ships generally have to ascend to 15,000 feet to be clear of the mountains and their air currents. This line will be operated in coöperation with an Italian company, the Aero Line.

Other good international routes not starting from Berlin are the following: From Amsterdam up the River Rhine to the Ruhr Basin, Cologne, Frankfurt, and Basle, and on to Geneva, with connections to Munich, Baden-Baden, and Constance, a tour of great scenic beauty. From London by way of Amsterdam, the Ruhr Basin and Erfurt to Chemnitz, the center of a textile manufacturing district (the so-called Cotton Air Express). From Rotterdam to Kassel, Marienbad (the famous Bohemian spa), and Prague, flown by a Czechoslovakian company. From Flensburg, near the Danish frontier, to Hamburg, Hanover, Nuremberg and Munich. The route Cologne-Leipzig-Breslau, by whose connections at both ends the farthest southeast part of Germany, industrial Upper Silesia, can be reached in one day from London or Paris. The great airline in the South connecting Geneva and Zurich with Munich, Vienna, and Budapest. The route from Geneva to Marseilles, Barcelona, and Madrid. A through connection between Berlin and Warsaw is still impossible for political reasons, as well as lines to the Saar.

The D. L. H. also offers again a number of airlines to well-known health resorts. The watering places on the shores and islands of the Baltic (Sellin, Stralsund, Hiddensee) and North Sea (Westerland, Wyk, Wangeroog, Norderney, Borkum) can be reached in a few hours from Berlin, and there is a daily and a special week-end service from the Rhineland and the Ruhr Basin to the last-named three islands. Baden-Baden and Marienbad are also within easy reach of the German capital. From Bremerhaven the largest flying-boat of the world, the Dornier Superwal, plies to the isle of Heligoland. The traveler also will have a great choice of scenic air tours among the scheduled services, for example the route from Hanover to Leipzig, which skirts the Harz Mountains, a round trip from Breslau to the Riesengebirge, the highest mountain chain of Northern Germany, an airline from Frankfurt to Baden-Baden and over the Schwarzwald Mountains to the Lake of Constance, and especially an Austrian service Vienna-Salzburg-Innsbruck-Constance-Zurich, which offers wonderful scenic beauties.

A special feature of the summer time table are the new mail and freight services (no passengers carried) from Berlin to the Ruhr Basin, Cologne, London, Amsterdam, and Paris, which will be run partly at night.

FRANCE

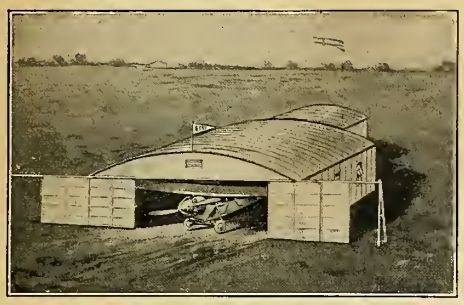
THE Aeronautical Chamber of Commerce of America has a reception booth at the Chambre Syndicale des Industries Aeronautique, held in Paris, June 29th to July 15th.

Through cooperation of the Department of Commerce and the National Advisory Committee for Aeronautics in Washington, the Chamber secured the assistance of Trade Commissioner H. H. Kelly, and J. J. Ide, representative of the N.A.C.A. at Paris, in attending to the details of leasing, decorating the booth, engaging personnel, and the installation of exhibits and photographs sent from this country. The cooperation of the Paris office of the Bankers Trust Company also was secured.

Photographs showing American aircraft products, American aeronautical magazines, and a large map and charts, showing the air transport lines in operation in the United States, are being shown at the booth.

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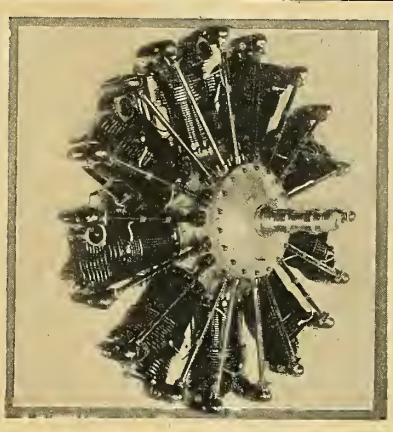
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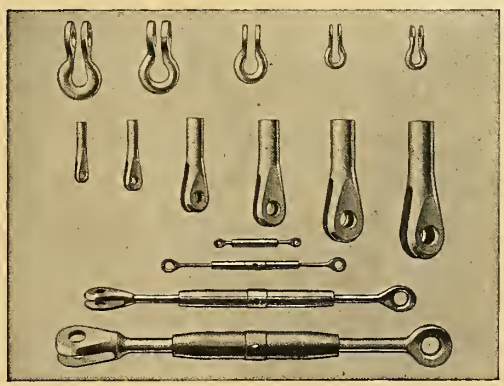
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AERO DIGEST will award a prize of $5 each month for the best humorous contribution puhlished. Only those pertaining to the aircraft field will be considered. Address the "Picked from the Air" Department, Aero Digest, 220 West 42nd St., New York, N. Y. Edna Snyder, Norwood, Mass., won the prize for July

An Airy Tale

He said to her, "Oh, *Fairchild,* I am a lone, *Lone Eagle.* Wilt thou *Travel Air* with me?"

Cessna, the little maid from *Ireland,* raised her eyes to *Stearman,* our hero, and replied, "Oh, my *Air King,* I would love to fly with thou, but *Ryan* would not like it."

"Never you mind," grinned *Stearman,* who stood as a strong *Spartan* against the cockpit of his plane. At that critical moment, however, a pesty *Dragon Fly* bit his nose, but this non-cursing pilot immediately regained his poise and continued smoking his *Gold Tip* cigarette in a nonchalant manner as he remarked, "*Ryan* shalt never know. He, the old *Viking* of the air, hath taken a few *Swallows* and now sleepeth sounder than an *Eaglerock* in yonder hangar. Some time ago I went to him and said, '*Waco* man! 'Tis time to rise thyself. The *Whippoorwills* are whippooring.' Then, *Ryan* telleth me he dreameth that *Prudden,* his friend, placed before him a delicious dish of *Pheasants, Falcons* and *Eagles.* With a knife and *Fokker,* he sayeth he would have finished them. When *Ryan* ended this tale he again did snore louder than a *Thunderbird.* So now, *Fairchild,* fairer than a *Bluebird,* you can flieth with me."

"Oh dear! Wilt not *Bellanca* be jealous if I ridest with thou?" queried *Cessna,* the *Fairchild.*

"Oh, no! She wenteth riding in *Stinson's Ford* with *Mohawk, Buhl* and *Wallace.* Wouldst that I had my *Monocoupe* so that we might ride side by each."

"Never mind, my brave *Crusader.* I'll ridest with thou. Some day we shall be the *International Challengers* of the air."

Thus, with a flip flop and a flap flip, the ship zouped up into the air and as all fairy tales end, they flew happily ever after.

Out of a Clear Sky

Scene, the Welsh coast. Airplane containing Miss Amelia Earhart, Wilmer Stultz and Louis Gordon descends. Taffy, a Welshman, approaches.

Miss Earhart—Could you tell us how to get to Southampton, please?

Taffy—Southampton? Well, I tell you. You take your first right and then your left until you come to Braich-y-gwynlwynnglan. Don't stop there, but go on to Ddinllaentrwynoclnnlayn and then take the first left turn, which will bring you through Mryndd, Caer-g-wrie and Llanfrrhaladrpenmachnln. That ought to bring you out near Bettws-y-coed, but if you find yourself going through Clynnogfwarglynbrackwwwvodeodo, you'll know you're off your path, because that road will take you away around near Rrydd-du and Llandewiclycwmdlyn, and you don't want to go there, do you?"

Miss Earhart—Oh, no. Southampton is where we want to go.

Taffy—Yes, that's where I thought you said you wanted to go. Well, you go on until you come to Trntll Point, opposite Cwffr.

Wilmer Stultz—Amelia.

Amelia—What?

Wilmer—What do you say we don't go to Southampton? Let's just stay at Cwffr.

Amelia (pensively)—No, Wilmer, let's turn her around and start back for Newfoundland.

—FRANK SULLIVAN.
(Courtesy of New York World.)

"What was the cause of young Smart's death?"

"Too much education."

"Over study, eh?"

"No, he took a correspondence course called 'Practical Aviation in Fifteen Lessons', and also a course in high pressure salesmanship."

"And then—"

"Then he sold the airport boss the idea of letting him try solo."

—*S. Ross.*

Owner of the Plane Whose Engine Conked Out: "Hey! Buddy, know anything about a plane like mine?"

Bright mechanic: "Oh, about 1,000 jokes."

—*Lewis Ingals, jr.*

Locating the Trouble

The street car stood at the end of the line while the motorman broke in a fresh "chew" and the conductor's thoughts turned to the rawness of the weather.

"Say, Bill, d'you think it's ever gonna get spring?" he finally queried.

"Wa-a-ll," said Bill, "as long as we're gonna have them airplanes up there agitatin' the heavens, we're gonna have busted up seasons, and I for one doubt if we'll ever have spring and summer and fall and winter on time any more."

—*Indianapolis News.*

The Pacific fliers report that they got into several open pockets during their hop to Hawaii. This hazard is likely to be encountered everywhere, it is said, except in the air over Scotland.

—*Philadelphia Record.*

He: "Everybody seems to like to hang out at the flying field."

She (sweetly): "O, is that why they call those things hangars?"

—*Elfrida Eichel.*

Father (wrathfully): "Your conduct has made you the talk of the town."

Daughter: "Yes, but how long will it last? Some darn aviator will fly across the Pacific or something, and I'll have to do it all over again."

—*S. Lindberg.*

An oldster and his son were passengers for the first time on an airplane flight.

As the earth seemed to sink beneath him and he realized that he was indeed suspended in mid-air, Dad, with shaking hands handed over watch and wallet, gasping,

"If anything happens to ME, everything is yours, my boy!"

—*Mary H. Strader.*

A Scotchman approached the stamp window at the Post Office with an air mail letter for which he purchased the conventional ten-cent stamp.

The clerk weighed it and announced that it would require an additional half-ounce of postage.

"Aw weel mon," replied the Scot, "the rate 'twill be coomin' doon August fairst. Dinna ya' mind holdin' till then?"

—*Kenneth Stern.*

FIRST SEAPLANE FLIGHT TO EUROPE

(*Continued from page 39*)

the 2,000 miles from Trepassey Bay to the coast of Wales in 20 hours and 40 minutes. A slight southward deviation in the course as Stultz followed it probably added two or three hundred extra miles to the distance as measured on the great circle course. The cruising speed of the Fokker trimotor equipped with 200 horsepower Wright Whirlwind engines and hampered to a certain extent by the big pontoons is between eighty and ninety miles an hour.

To recapitulate: The *Friendship* took off from the waters of Boston Harbor on the morning of June 3, bound for Newfoundland. The ship with total load including Lou Gower, another emergency pilot who was to go as far as Trepassey, weighed about 12,000 pounds and try as he might Stultz couldn't get her off the water. Gower stepped into an attending motor boat and the plane got away. Stultz encountered fog on the Nova Scotian Coast and put into Halifax for the night. The next day they flew on to Newfoundland.

Ten days passed before suitable weather was in prospect and then it was not good enough to be classed without qualification as "favorable." During the tedious wait Stultz carried out more load tests. Cross winds prevented a take-off on one occasion and the lack of any wind at all held the pontoons fast to the water on another attempt. On the morning of June 17 at 9:51 Eastern Standard time after three more failures to rise because of little help from the wind and the throwing over of more fuel the *Friendship* got away. Her total load was then between 10,000 and 11,000 pounds.

Although clear weather prevailed at Trepassey within an hour the plane nosed into fog, then snow and hail. This continued for a hundred miles or more and then for a short period the *Friendship* had clear weather, but only for a little while. From this point on all the way across it was fog and rain with now and then snow for variety. Like Commander Byrd and his crew after the start Miss Earhart and her shipmates saw no ocean until close to the British Isles.

Nor were they seen from the water until they came down over the *S. S. America,* seventy-five miles east of Cobh (Queenstown) after they had missed Ireland entirely, to get bearings. Stultz turned northward after sighting and circling the steamer and an hour and forty minutes later, after circling the town of Burry Port and narrowly escaping disaster against the tall stacks of a zinc refinery, he landed in the estuary, tied out to a buoy and demanded "gas" of the skipper of a tiny patrol boat that put out to the plane from shore.

They wanted to go on to Southampton at once when informed that they had already crossed or had flown around Ireland, but the hospitable Welsh people prevailed upon them to come ashore and spend the night. The next day they flew on to Southampton where a typical transatlantic reception committee headed by the dignitaries of the town and representatives of the nation met them. While Stultz and Gordon have purposely remained in the background contenting themselves with wandering around London and side trips to Croydon Miss Earhart has been entertained and fêted by official Britain as well as distinguished citizens of the Empire and the aeronautical world. They will land in New York early this month and return directly to Boston.

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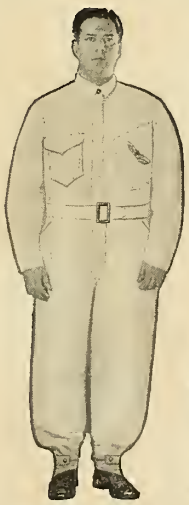
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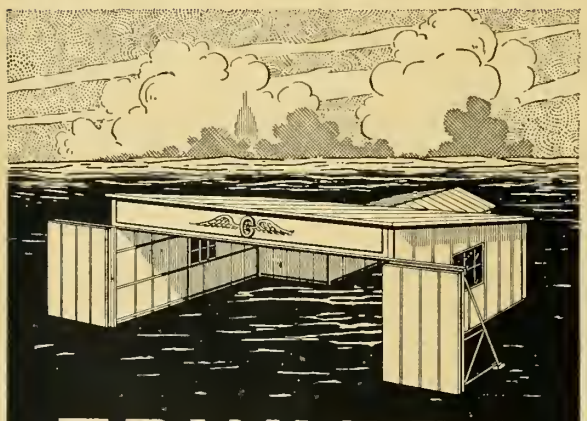
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THE PN-12 NAVY PATROL PLANE

(*Continued from page 46*)

PN-12, then, owes much to her predecessors, and has inherited much of her prowess without any great change in appearance.

Equipment is conveniently arranged in the forward cockpit under a removable and transparent cover. The pilots have been placed on seats that may be adjusted conveniently to the rudder bar and bridge. The rudder bar is aligned by a pantagraph arrangement that keeps the pedal always normal to the foot. The bridge is of sturdy dural tubing; and although lighter than the wooden type, the cross tube has been omitted, which permits easier passage through the plane. The instrument board is indirectly and variably lighted with flying instruments grouped before each pilot. Engine instruments are provided for both pilots and mechanic in a convenient location, so that heaters, pumps, etc., may be reached with a minimum of movement.

The work of developing this new plane at the Naval Aircraft Factory has been done largely under the direction of Commander R. D. Weyerbacher (CC), U. S. N., former Chief Engineer and now Manager, and Commander W. W. Webster (CC), U. S. N., former Production Superintendent and now Chief Engineer.

AIR CORPS DEMONSTRATIONS

(*Continued from page 32*)

ducted and for the unquestionably fine results achieved."

That General King, Commandant of the General Service Schools, was favorably impressed is evidenced by the following letter which he addressed to the War Department:

"I have to report that the demonstration given by the units of the Air Corps at this station was a splendid success in every way. I was most favorably impressed with the quiet, orderly and skillful manner in which the different units of the command reached this station—with their appearance, conduct, and demeanor while here, and with the prompt, efficient and effective demonstration given.

"The demonstration, while primarily for the instruction of the students at the Command and General Staff School, was witnessed by a large concourse of the civilian population from the surrounding country.

"The whole demonstration was so conducted as to impress me with the splendid efficiency and discipline of the units of the Air Corps which participated.

"Altogether, including travel from and to home stations the planes involved were in the air 3000 plane hours and travelled 330,000 plane miles, almost twelve times around the world. In spite of adverse weather encountered while travelling, no delays resulted from any cause, and the concentration, operations and return to home stations of the units involved were accomplished without accident."

AIR—HOT AND OTHERWISE

(*Continued from page 38*)

inconvenience, due to interrupted business and employment arrangements. Their military work is kept up during the year at their own expense and is purely patriotic, and the fact that they are spread from ocean to ocean and from the Canadian line to the Gulf, makes the administration of the force difficult.

This is another of the problems which Congressman James has tackled with a fine patriotism, and his bill, introduced but not passed during the last session of Congress, seems to offer the best available solution for the puzzle.

It provides for a Reserve Division in the War Department, which shall have supervision of the Officers Reserve Corps, the Reserve Officers Training Corps, and the Citi-

zens Military Training Camps. The Reserve Officers Training Corps, a direct outgrowth of the Officers Reserve Corps, is planned to graduate into that body annually 7,000 young reserve officers who have finished some standard college course. Naturally Reserve officers are more useful than any other agency in insuring good service by our Citizens Military Training Camps, in which 35,000 youngsters every year are taught far more than military matters, being instructed in good citizenship generally.

It was because of these obvious links that Congressman James decided that the Reserve Officers Training Corps and the Citizens Military Training Camps should be administered with the Reserve and by the same division of the War Department.

At this point, however, occurred one of those unfortunate misconceptions which so frequently complicate human affairs. In some way some of the leaders of the National Guard gained the idea that this bill meant the creation of a Reserve force with a large enlisted personnel—they called it "a kind of continental army"—which would rival and harm the National Guard.

No thought could have been further from the minds of Congressman James and the Reserve officers who favored the bill. They never wished to establish an enlisted force in peace time, never thought of injuring the National Guard, toward which they have the friendliest feeling, and are and have been glad to urge Reserve Officers Training Corps graduates and the men who have been instructed in the Citizens Military Training Corps to go into the National Guard, which they wish to help in every way.

The bill, which was introduced in the House by Mr. James and in the Senate by Senator Reed, of Pennsylvania, Chairman of the Senate Military Committee, will be approved by Congress, it is hoped, during the short session.

AERO DIGEST has a special file for the documents indicating the activities of Congressman Frank James and that file is treated with respect and admiration. It might be labelled the official activities of a True Patriot. All the documents which fatten it are records of constructive achievement of worthy plans for the nation's good, indicative on almost every page of this intelligent legislator's comprehension and appreciation of the importance of aeronautics in its many manifestations to the welfare of the nation.

His fellow-members have learned to understand that when Congressman Frank James begins to talk he knows what he is talking about. If he talks at all about a thing he will be found to be a specialist upon that subject.

It would be disastrous to the country, especially to its defense and particularly to the interests of aviation, if he were not returned to Congress. No other man in all the nation has the knowledge which he so conscientiously has acquired; no other man is equally well equipped to struggle for our national defense and no other has that natural impulse so strongly developed in his personality. Frank James in Congress is a national asset.

WOULD that we had such a man in the Senate. When Hon. Hiram Bingham was elected we thought that he would be that kind. But in his case political expediency seems to have resulted most unfortunately. As a member of the President's Aircraft Board he was not a notable success and careful watching of him since then has convinced us that both on the floor of the Senate and in the Committee rooms he is a disappointment. Harry Lauder used to tell a story of two Scotchmen who decided to have a wonderful time in Edinburgh, and began. But presently

(Continued on next page)

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(Continued from preceding page)

"bang went sixpence" and this so discouraged them that they went back home with behind them little record of real gayety. Well, we are disappointed, too. For bang went Bingham.

Senator Bingham has done little for aviation since he has been in office. What a chance is that which he has lost! Other men have gone to Washington from Connecticut's rock-ribbed soil, which used to growl at farmers, but now purrs under the caoutchouc caresses of countless automobile tires on every road. The citizens of that great state which played so large a part in the shaping of America's destiny have other men than Bingham. There is, for instance, Governor Trumbull; there is Tilson, majority leader in the House. They would make good men in the Senate, and the voters of Connecticut, having watched the Bingham failure to make good for them, could do much worse than to select for the desk which he at present occupies, either of these energetic and high-minded men.

Senator Bingham has not had as an excuse any ignorance as to what American aviation has done, can do and will accomplish. He is informed, which makes his failure inexcusable. His mental motor misses, that's the tragic fact.

As far as aviation is concerned Senator Bingham fails even before he tries the take-off and that means that his mental, moral and psychological powder's wet in connection with the whole matter of our national defense. Glance at the two men, James and Bingham, and burst into tears. The contrast is too much for ordinary nerves to stand. Remember those saddest words of tongue or pen. Well, Bingham might have been, all right; but Bingham hasn't been and isn't.

So that's that. Another washout in the Senate chamber.

WHAT a gloomy day this is! Trying to forget Bingham we pick up some more papers from our desk which look more interesting than his non-existent record and find they have to do with that endeavor at constructive legislation which is documented as H.R. 12814—in other words, The Furlow Bill. This was the effort of another worth while man hailing from the West, Furlow of Minnesota, and was designed to provide a promotion list that would remove the officers of the Army Air Corps from the Single Promotion List.

It was reported favorably by the Sub-Committee in Charge of Aviation and later by the full Committee. May 7th the House of Representatives did it the signal honor of passage without one dissenting vote, because the House Committee on Military Affairs had been conscious for some years of the personnel situation existing in the Air Corps. This bill solved it.

In the Senate, though, where Bingham slept profoundly at the switch, someone evidently determined to keep the Air Corps on the Single Promotion list with all the other Army officers and so the entire House Bill was written out, a substitute being provided which, while pretending otherwise, really creates a situation worse than the old one for the Air Corps junior officers.

It is a tricky document, this substitute, full of guile and cleverly deceptive statements. As a law it would wreck Air Service morale and treat first lieutenants even worse than hitherto, though in the past they have been looked upon, apparently, as flying lepers.

The suggested temporary promotion would spell ruin to a vital branch of national defense.

The Air Corps promotion muddle has existed eight long years and putrefaction has set in. This Senate scheme (maybe we shall some day tell the story of its birth) would

stimulate decay.

Air Service is a thing apart. Its high death rate makes it tragically unique; its tremendous demands on brain and body suggest the wisdom of getting officers to the rank of major while they still have something left of youth, the greater responsibilities thrust on officers make their service most unusual.

The Furlow Bill, as passed in the House and slaughtered in the Senate did not offer any special privileges in the way of promotion to officers of the Air Corps, but recognized the necessity for a definite number of officers in each grade and assured that an appropriate rank would balance heavy responsibilities.

Col. Lindbergh, before the House Committee, March 21, summed up as follows:

". . . our air force should constitute a first line of defense, ready to take initiative when danger threatens the nation. No time may be permitted for preparation. Efficiency will be gained by proper peace-time care of personnel. Expectancy of life for flying officers is far less than in any other occupation. The rate of attrition is high, the strain is excessive, the period of greatest flying efficiency is limited, responsibilities of air officers are heavy, promotion for a large proportion seems to have stagnated. These observations have led me to believe that the problem of air officers is special and needs consideration by itself."

But unfortunately it was not the problem, but the bill, that got the special consideration of the Senate—very special—and it got it where the chicken got the guillotine.

The Furlow Bill had its inception in a desire to correct injustice and give the flying men a chance by creating a special promotion list for them. What is the influence which has so bitterly assailed this obviously right action? Secretary of War Davis, Assistant Secretary Davison, General Summerall, the Chief of Staff, General Fechet, Chief of the Air Corps, as well as such world famous fliers as Lindbergh and all the others are for the original bill. Someone will be wrong if this bill is defeated finally or goes through in an ineffective form. The amended bill is just another clever stab at the Air Services. It is a verbal swindle, intended to deceive the people into thinking they were giving to the fliers that which they desire to give them, just and generous treatment.

This hocus pocus has not been worked because of patriotic love for Uncle Sam's defenders. It has been a dog in-the-manger strategem by certain influences which would not have been benefited by it and were unwilling to see the men who take far greater chances, endure far greater strains, are almost sure of shortened lives get their just dues.

There was a nigger in that woodpile of "full support" which was supposed to have been back of the Furlow Bill.

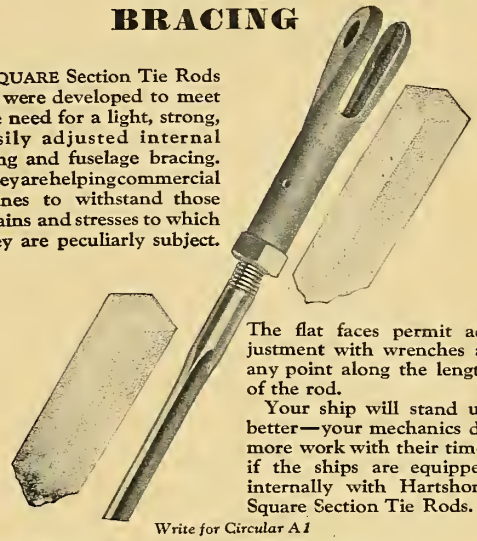
It should be the business of the people, and especially of the newspapers, which must be the people's chief source of information with regard to Washington and its vagaries, to find out what the vicious influence has been that has succeeded in refusing justice to our airmen after the unanimous endorsement of the House of Representatives. Who's lying?

AERO DIGEST wishes now to go on record as asserting that if the virtually unamended Furlow Bill does not become a law during the second session of the Seventieth Congress there will be reason for a careful study of the Senate Military Affairs Committee and undoubtedly this study will lead to another place in Washington, where the Army Air Corps should receive unqualified support in any move that promises the good that the Furlow Bill intends.

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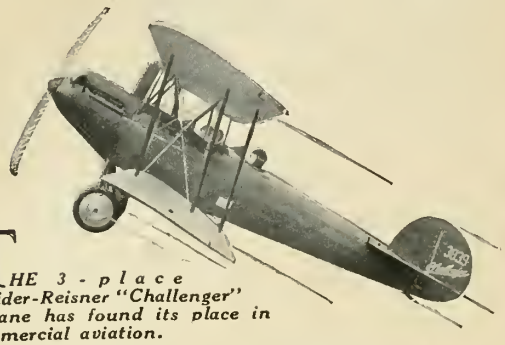
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THE BIG BALLYHOO

(*Continued from page* 41)

and its job is to make us want what is good for us. It is like the burr under the saddle or the spur on the heel, which keeps the horse moving when he would sooner nibble at the wayside grass. It is by no means natural, since if we were left to nature we would spend these summer days sitting under a tree fishing, instead of hustling much as usual after our hopes, ambitions and good intentions. But it works all the time with human nature, playing a skillful tune on its appetites, its curiosity, its hidden possibilities of energy and enterprise. And if it quit even for a little we should all tail-spin back into the Dark Ages and civilization would be washed out in the crash.

The basis of advertising is Psychology, which is a modern device for determining which way the cat will jump so that the wise man can be there with a basket when she makes up her mind. They teach Psychology in the colleges now, where it was first introduced to bring the number of courses up to an even five hundred but has since pushed ahead until like the Arab's camel it occupies most of the tent. A modern student, in fact, would no more think of leaving college without Psychology than he would think of entering it without a vaccination scar and a sports roadster.

An earnest student of Psychology concerns himself with a vast assortment of foolish phenomena. He learns the reason why a man will not sit on a hot stove; why red is not green; why paperhangers read tabloid newspapers, and how old is Anne. He does queer experiments with guinea-pigs, goldfish, bullfrogs and the college janitor. In order to study Psychology a frog's leg is hung up and pinched by the professor or one of the more attractive of the co-eds. If the leg kicks it is Psychology; if it doesn't, it is a stale frog.

Some things not yet determined by Psychology are (1) why men wear red neckties, (2) why beer tastes best out of brown bottles, and (3) why the Navy Department can't see beyond the end of its nose. When these are settled, there will be others. But it has nevertheless found out a great many things about the way the public responds when it is tickled under the right rib, and these we need in building business for the airplane. We need, in fact, a national campaign of expert Ballyhoo, in which everybody concerned takes a share,—the government, the national organizations, the manufacturers, the operators, and individual enthusiasts like ourselves. And we need it bad, if we don't want to die of fatty degeneration of our seamless tubing.

There is a lot of it being done already. Henry Ford,—I suppose you have heard of him—is putting out a wonderful series of advertisements, not specifically for the Ford plane, but for free air and freer use of it. They are well worth studying for their keen analysis of the public problem and their effective educational value. (I'm afraid this sounds like an ad. for Henry, but we are over in the advertising pages by now anyway, and maybe he won't mind. And if it comes to his attention that our Sweet Genevieve is the original Model X and is on her last fenders and ready to be put out to pasture for the rest of her days, and he should happen to think something ought to be done about it in consideration of this unsolicited tribute,—why, there will be no serious objection from this end of the transaction.) The venerable and bewiskered Guggenheim Foundation is doing its best to spend its money for the utmost good of the cause. The aeronautical magazines are as creditable a performance as any modern industry can present, even though we resist the natural temptation to state that AERO DIGEST is the finest of the lot. The newspapers,—most of them,—have got over their first suspicions and their craving for bigger and better accidents, and are circulating a lot of sound information and inspiration concerning air travel. Even the colleges and universities have come out of their customary coma and given space and time to aeronautics.

But there is still one weak link and a big one, in the national campaign for public education. The rank and file of the trade, and particularly the flying fields, are not yet up to the minute nor up to their capacities and possibilities in building the business of the air. Most of them, of course, have had other things on their mind. Most of them have been properly wary of promising young publicity agents, who promise plenty and take them across in the same proportion. Most of them are scared of advertising appropriations which cut into profits which usually aren't there. Many of them shrink from advertising which may benefit their competitors as well as themselves.

It's about time for my customary Fourteen Points, which close the show like the acrobats at the vaudeville and help to clear the hall.

And with your kind permission I'll pass on a few harmless hints for flying fields, relying on the fact that there are now 1,026 such fields in operation, in the country and all of them willing to get something for nothing, even if it is worth just about that much. I have had at least six weeks experience in the publicity business and have also seen the inside of a newspaper office and called the City Editor by his first name, so I know as much about it as most of the Public Relations Counsels. And if you don't believe that, one of them will soon be nibbling at your bank roll.

1. Advertising, after the first expensive splurge, ought to be proportioned to income. If you get $3.00 per ride, you ought to be able to spare 5% of it for advertising. If you can't you are sailing so close to the wind that you should have your head examined. If you can, spend it.

2. Get the confidence of the newspaper boys. If you hold out on them they will do the same on you.

3. When something interesting happens, shoot the news to your papers. But don't fake it. And go easy on the aerial weddings, the flying grandmothers and the air shipments of electric stoves. Editors will always take news, but they take bromides only on the morning after the Press Club dinner.

4. If you have someone of the staff who can write without splitting his infinitives all over the shop, offer a weekly column of air news, local and otherwise, to your best paper. He might even get paid tobacco money for it.

5. Publicity stunts usually cost more than they are worth. But if you go in for them, use more imagination and less gasoline. And don't let a bathing beauty on your field. She will bring a crowd but she won't make it fly. You're in the flying business,—not the hot dog profession.

6. Hook up with public events in the neighbourhood, so long as they don't mean free rides for everybody from the mayor to the dog-catcher. There's no such thing as a free ride.

7. You can get a crowd by stunt shows, but it won't do you any good. People stretch their necks at the "intrepid aviator," and are perfectly satisfied that he shall have the air to himself. But when they see their own kind climbing in and out of a cockpit and taking a sensible ride, they begin to think about trying it. That's Psychology.

8. Go easy on advertising in small town papers. Inside of three weeks all your neighbours will know you have a flying field anyway. And the effectiveness of such advertising decreases as the square of the distance from your field But don't be mean about it. Newspapers must live, and it won't hurt you to have a friend at court if anything unpleasant ever drops on you.

9. Keep your ships clean and your field clean. That sounds obvious, but I know some awful dirty ones. Keep your customers' cars out of the mud, and the dust out of their eyes. Otherwise they will go home and cuss you from prop to tail-skid.

10. Take what chances you get to send someone to talk to civic clubs, luncheons and schools. It's real educational work, it won't cost much, and it will get you all sorts of free space in the papers.

11. Have motion pictures made of your field in operation, and loan them wherever you can.

12. Invite the school kids to visit your field and shops, under proper supervision. Offer airplane rides as prizes for school work in physics and such subjects. Remember that the youngsters will be your customers in a few short years.

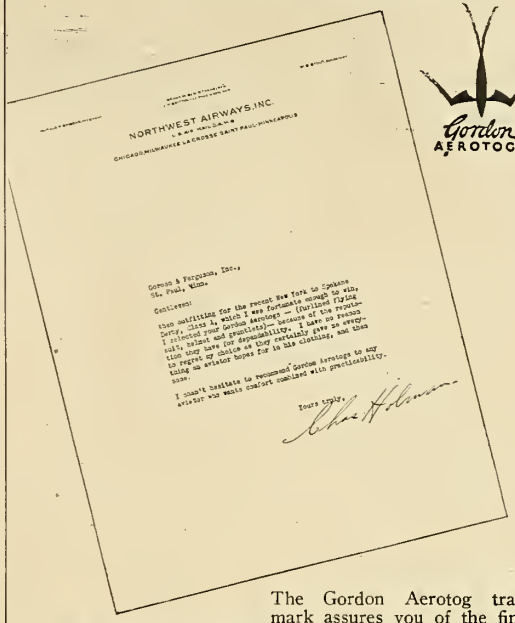
13. Work up a pamphlet describing your field, planes and flying service, with plenty of pictures. Give one to every passenger, so that he can take it home and lie about it to his friends and neighbours. That's more Psychology. If you are smart about it you can sell your cover space to local advertisers, so that it won't cost you anything. That's plain Business.

14. Get a distinctive trademark and use it everywhere. Have it made up in cuts of one-column and two-column widths for newspaper work. Smear it all over your planes, hangars and signs. Remember always that it pays to advertise, but you have got to be snappy about it.

Those are my Fourteen Points for Practical Publicity for Flying Fields. You can make all of them work for you, at less than it will cost you to have a press-agent hanging around. There's one weak spot in them, of course. They relate principally to hop-flying, and you and I both know that hop-flying is a racket that won't last forever.

(Continued on next page)

"SPEED" HOLMAN PRAISES GORDON AEROTOGS



Gordon Aerotogs

The Gordon Aerotog trademark assures you of the finest in aviation clothing. Tailored by experts. Carefully finished in every detail. Fully guaranteed. Fur lined, wool lined and all-leather flying suits; leather blouses and jackets; leather or cloth helmets, gloves and mittens. If your regular dealer cannot supply you, write to us today.

Gordon and Ferguson, Inc., Saint Paul, Minnesota.

Get this New Catalog of Aircraft Wire Today!



Mail the Coupon

Belden Manufacturing Company
2304-B South Western Avenue, Chicago, Ill.

Of course we want your new bulletin which gives the latest data regarding shielded wiring for aircraft, aircraft harnesses, cables, and other valuable wiring information.

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Distributors for the
ALEXANDER EAGLEROCK

Our facilities for student training in both land and seaplanes are complete. Only new Eaglerock planes used. Experienced pilots as instructors.

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Next time you're in Atlantic City, make it your business to see our permanent exhibition on the famous Steel Pier.

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NOW LOCATED IN THE HEART OF NEW YORK CITY
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WE TEACH YOU EVERYTHING



Flying Instruction on New Production "Bird Wings"

Our instructors all have ten or more years flying experience. You don't wait on the weather here. We teach every day. We also teach you to build airplanes, by actually working in our factory. Air traffic rules and meteorology included in courses. Square dealing, and safe, efficient training are our paramount considerations. Courses from $200 to $350.

FLY AND OWN A "BIRD WING" PLANE.
Five minutes at the "stick" and you will place your order for one. Price, OX, $2,795.

ST. JOSEPH, MO.
Night flying instruction *Class AAA lighted airport*

(*Continued from preceding page*)

Do you remember how we once paid two bits to ride around the block in an automobile? Well, them days are gone forever, and they are fading in the flying business. But hop-flying keeps the cash register ringing while we wait and hunt for bigger and better business; while we wait for the public's perspicacity to catch up on our own; while we wait for commerce to take to its wings. It's coming, and coming fast, and the plums of the future will fall to those who are learning now how to catch them.

THE BATTLESHIP BUBBLE

(*Continued from page* 35)

the *Arkansas* is only 26,000 tons, that of the battle cruiser *Hood* is 41,200 tons. I make this explanation because of the generally prevailing impression that the battleship is the most powerful vessel afloat. That is not always so. A battle cruiser is about 20 per cent. weaker in gun power and about 30 per cent. weaker in armor than a battleship of the same size and class. But a 1925 battle cruiser may be more than twice as powerful as an old battleship of the pre-Dreadnought class.

But whether I mention battleship or battle cruiser, the general characteristics of the hull construction—at least so far as resistance to underwater damage is concerned—are the same in both. Those characteristics are: an outer steel skin riveted to a framework which carries an inner skin of about the same thickness—that is, the thickness of a match box; many longitudinal and transverse bulkheads which divide the hull into a series of separate compartments; and the bulges, or blisters. The belt of armor, capable of resisting a terrific impact, *forms the upper part only of the outer skin, and goes only a very few feet* below the water-line. Keep that fact in mind.

The inner skin and the many compartments need no explanation other than the plain statement that they are intended to confine underwater damage to the section damaged. But about the bulge a word should be said, for it was loudly touted some years ago as a sure cure for the torpedo danger. As originally designed, the bulge was a thinner plating built out from the hull of the ship, on both sides, and formed a series of inner-divided compartments. It was, in effect, a thin extra side against which a torpedo could explode and thus expend much of its force before that force struck the real hull of the ship. Various old battleships were so fitted and later ships have the bulge built integral with the hull. Naval opinion itself is divided on the protection afforded by the bulge, but we may accept the bulge as an added protection. At least it gives more compartments. Though with a sufficient number of large bombs dropped from the air any number of compartments may be burst and the ship be sent to the bottom. In fact, compartments or no compartments, if the initial damage is sufficiently severe, no further bombardment is required; the action of the sea, alone, will insure that the craft goes down. This fact was demonstrated by the German battle cruiser *Lutzow*, which received a terrible hammering from the English ships at Jutland. I quote Wilson:

"Injuries on or below the water line had filled many of her compartments, but at 11 P. M. after the battle there was some hope of getting her into harbor, when *one after another the bulkheads began to give way* under the enormous pressure of the water in her hull. At midnight the pumps could no longer control the water and keep it from reaching her dynamos. The water presently reached A turret and poured through it to the foremost boiler room. An attempt to go astern and thus relieve the strain on the bulkheads failed because the bow sank to a draught of 44 feet and the propellers emerged. The order therefore was given, 'draw fires'; four destroyers which had accompanied her in her last struggles came alongside; and with three cheers, in perfect order the ship was abandoned, the wounded being first removed, and the captain quitting her last when the bridge was already touching the water."

Battleship exponents lay great stress on the safety afforded by the double skin and by the bulkheads—none of which are thicker than the hull plating, which is five-eighths of an inch. Of course they are a protection. But the fate of the *Lutzow*, a ship of 26,300 tons, of modern construction, demonstrates clearly that *bulkheads afford no certain protection*, for if the ship is sunk deeply enough, or is rolling or pitching in a heavy sea, the pressure of water alone will burst bulkhead after bulkhead—for they are not braced, as is the side plating of the ship, by the cross-frames. The *Lutzow* took in over 8,000

tons of water before she sunk. And the damage that sent the *Lutzow* to the bottom was considerably less than would be inflicted by our largest aerial bombs.

In the bombing of the *Ostfriesland* General Mitchell mentions briefly a point that is most important. He states: "That night she listed so badly that 2,000 tons of water were let in on the *other side* to keep her straight up so that she would not roll over." Thus there were 4,000 tons of water in the ship, and she had sunk to 40 feet. And that damage had been inflicted by the smaller bombs, not the largest. In other words, if the ship had been in battle, and not merely lying as a hulk in a sheltered bay, she would have been put out of action, for, as Sir William J. Berry, K. C. B., Director of Construction, British Admiralty, states: "Every working detail in the design of a warship is designed on the supposition that she will float in an upright position at suitable trim. Any appreciable heel or departure from the correct trim immediately introduces difficulties." (The *Lutzow* was so out of trim that her bow went down and her propellers emerged, leaving her helpless. Further, torpedo tubes and guns cannot be worked properly if the ship is heeled over.) Sir William continues: "The protection provided by vertical armor and thick decks has its maximum value when the ship is upright. A heel of quite small extent greatly reduces the protection provided against gunfire. A heel which lifts the unprotected side of the ship out of water is clearly an opportunity for the enemy to inflict greater damage." (By tipping the ship so that the thin under-water plating is exposed to fire.) "Further, the navigation is adversely affected. It is more difficult to keep course and speed, and if, in addition, damage should have been done to the working parts of the ship she gets into such a condition that the enemy has her more or less at his mercy."

Such a condition was that of the British battleship *Irresistible* at the Dardanelles in March, 1915, as reported by Mr. Wilson: "At 3:14 the *Irresistible* was seen to be heavily hit and at 4:15 she struck a mine. Her crew were removed with only 20 men missing or dead, though before the mine disaster she had been severely hit, and both her turrets had been put out of action. The *Ocean* struck a mine and she too had to be abandoned in a sinking condition. Next morning both the *Ocean* and *Irresistible* had vanished, having been sunk by Turkish gunfire as they drifted in the Straits."

I quote this to suggest that a battleship need not necessarily be sent immediately to the bottom by such a weapon as an aircraft bomb in order to insure its eventual destruction. If sufficient damage can be done the ship to render it motionless, or at least incapable of escape, it may be finished off at the leisure of the attackers. If one side or one end of a ship is damaged by the explosion of a mine or bomb, the weight of water admitted to that side or end must be counterbalanced by admitting an equal amount of water to the opposite side or end—else the ship is rendered unmanageable. She must be sunk further in the water, which reduces her speed and buoyancy, and stops her entirely if the water reaches the fires and engine room; upon which the undamaged ships in the squadron must slow down to her speed, or else leave her behind. And the fate of a battleship that falls out of line and loses the support of the others, in the face of a powerful enemy, is not long in doubt. From which is it not reasonable to conclude that it is not even needful to sink a battleship at once in order to put her out of action and ensure her eventual destruction? Despite the many compartments, despite the bulges, is it not evident that a wounded battleship, though she might float indefinitely with only those initial damages, would, by her very incapacity to keep up with the fleet, fall an easy prey to the enemy—whether the enemy happened to be a Turkish gunner on land, as at the Dardanelles, in 1915, or a bomber in an airplane, as in the next war?

In conversations I have had with Navy officers, who, one might think, would be familiar with the subject, I have been surprised at the lack of knowledge some of them had of the damage inflicted on ships' hulls by the explosions of aircraft bombs and torpedoes, which also may be dropped by airplanes. The idea held by more than one of them was that a good-sized hole—say a dozen feet in diameter, at most—was blown in the hull, and that plates were strained, which caused a compartment or two in the immediate vicinity of the hole to leak. Such an idea falls far below the truth—so far below that I am impelled to cite several instances of actual damage to actual ships, in order to correct this erroneous impression, which possibly is not confined to Navy officers.

The English battleship *Marlborough,* which was carefully designed

(*Continued on next page*)

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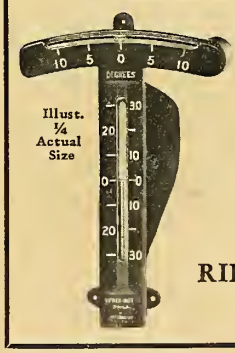
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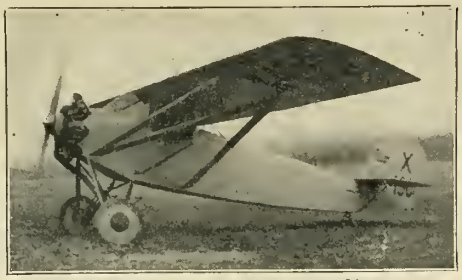
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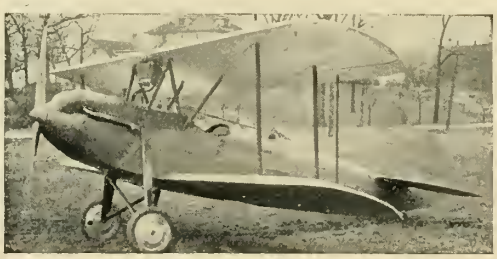




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(Continued from preceding page)

to be safe against the explosions of two torpedoes in any position, was torpedoed on May 31, 1916—and with only one torpedo. She was struck 18 feet below the water line, and *the side was damaged for a length of* 70 *feet and a width of* 50 *feet* at the widest part. She immediately took on a list of 8 degrees and her speed fell to 12 knots, and later to 8, while her Diesel engine and hydraulic engine rooms were put out of action, and 2 men were killed. However, with this damage she was able to make port. But will it be seriously advanced that she could have survived the effect of *two* torpedoes, which she had been designed to withstand?

Mr. Spanner quotes from the Admiralty "Manual of Seamanship": "The torpedoing of merchantmen in the war resulted in a class of cases for salvage characterized by enormous damage to the hull, *the holes often being of such dimensions as 60 feet by 40 feet.*" And I urge the reader to give thought to the fact that the war-head, or explosive charge, of a propelled torpedo is only 400 lbs., while that of a large bomb is over half a ton. True, the torpedo explodes directly against the hull, while the bomb may explode some feet from the hull. But the effect of an explosion several feet or many feet away from the hull may be as serious as if the explosion were directly against the hull; for water is non-compressible, and therefore transmits the force of the explosion almost undampened.

This was demonstrated during the bombing tests on the old American battleship *Alabama,* in 1921. The *Alabama* was towed into about 35 feet of water near Tangier Sound in Chesapeake Bay, and sunk in 30 seconds by the first 2,000 lb. bomb dropped by Captain Lawson's Squadron. Six other bombers coming behind Lawson struck her with their projectiles, and within four minutes she was a tangled mass of wreckage. Now, for six years the Navy has contended that the *Alabama* was sunk by a 2,000 lb. bomb that struck near the mainmast; but General William Mitchell contended that she was sunk by the 2,000 lb. bomb that *fell all of 40 feet away.* For six years the Navy allowed the *Alabama's* shattered hull to lie in the bay, although they knew that it had to be removed eventually. I believe that they did not want it removed *because they did not want the facts revealed;* for the facts are absolutely damning proof of what terrible damage a large aerial bomb can do to a battleship's hull.

After more than six years, the *Alabama* was raised and towed to Union Yards, Baltimore, to be broken up. *General Mitchell's contention was absolutely supported and confirmed by the wrecking engineers,* who found the hole below the water line where the General said it was—*a hole 78 feet long by 47 feet wide*—and about which nothing was contained in any publication from the Navy Department concerning the *Alabama.*

In order to show from history actual damage and loss inflicted in battleships during warfare, I have been forced to give instances of damage by shell-fire, torpedo, and mine. That is because aerial bombs were not used against battleships in action during the last war; for at that time efficient bombing planes and efficient large bombs had not been produced—*a condition that no longer exists.* But in the space limits of this article I have been concerned solely with the task of showing the battleship to be the very vulnerable ship that it is, easily subject to destruction from shells that have only a fraction of the explosive content of modern aerial bombs. The damage that actually occurred to battleships in the last war, through the action of shells, *is relatively small* compared to the damage that will be inflicted in the next war by *huge bombs dropped from the air.* I believe that the battleship will be helpless even to remain afloat against an efficient air attack; and I trust that in the brief limits of this article I have given the reader some idea of what a thin steel bubble the battleship is, and of how easily it may be punctured and sent to the bottom of the sea.

Finally, I do not believe that the problems of National Defense are so complicated that they are beyond the comprehension of the average tax-payer, whose money to-day is being spent lavisbly in the upkeep of a service that will not—more, *that cannot*—give him in time of war the protection that he is paying for in time of peace. But I do believe that the average tax-payer of these United States should himself examine the status of this mainly surface-going Navy, and examine it in the light of the advances that have been made in aviation. And he should satisfy himself as to the relative importance of the airplane and the battleship as fighting craft. For of a surety they will be opposed to each other in the next war.

OCKER-MYERS METHOD OF BLIND FLYING

(Continued from page 48)

ulus to the vestibular.

We know that the harmonious actions of the three named senses give to us perfect equilibrium providing, of course, that they are all in a healthy condition. Then, by the use of this "trinity sense" we are able to realize and maintain position, rate of motion, and to generally fix ourselves with relation to the earth and material objects. It is also true that partial equilibrium may exist with all three of them imperfectly acting. Adjustment to conditions will take place if but two of them remain to function properly.

Everyone is acquainted with the effect of dizziness accompanying the spinning motion of the body. When dizzy we make an involuntary effort to keep our balance and this effort is sustained until the dizziness has subsided. When denied the use of our sight sense under such conditions we fall to the floor or earth irrespective of our conscious efforts to do otherwise.

If we are placed in a Jones-Baran chair or upon a stool that can be revolved about a pivot we find that under blindfolded conditions we react to the turning and stopping of the chair in certain definite ways. Under such conditions our sense of sight has been denied us by means of the blindfold. Our muscle sense has been greatly impaired due to the fact that we no longer have contact with terra firma. We are then depending upon the reactions of the inner ear alone to maintain our balance.

Strange to say, under such conditions, the vestibular gives to our brain impresisons that we fail to correctly interpret and we cannot maintain equilibrium. Turned slowly to the right and stopped: the immediate sensation is that of turning to the left. Turned slowly to the left and stopped: the impression is that of turning to the right. If you are turned right and stopped you receive the sensation of turning left. Then, if the turning be continued left, until the action of the inner ear is co-incident with body movement, the sensation that you will be conscious of is that all body movement has ceased. Further, if the turning of your body be stopped, or the speed retarded, there will be an immediate sensation of turning in the opposite direction as well as an added sensation of falling. When this occurs a true state of vertigo has been produced. Every healthy human will, when denied his "sense of sight" and his "muscle sense" and subjected to vertigo, receive the above defined impressions.

The sensation of vertigo is always opposite to movement and the sensation of falling is always opposite to that of vertigo or in the direction of movement. These facts long known to the medical profession have not been commonly understood by the layman.

Through the findings of Captain Myers we have come to realize that the same conditions govern man's ability to maintain his equilibrium while in the air as when he is on the ground, with one exception: he cannot possess a true "muscle sense" when he removes himself from the environment responsible for it, that is, Mother Earth.

To maintain his equilibrium when he is in the air every airman depends upon two of the "trinity senses," namely, sight and vestibular plus his "seat sense" or the feel of the ship. Under "blind conditions" he is dependent upon two alone; his vestibular and his "seat sense" and these are not, as yet, sufficiently coördinated and trained to meet with every condition that presents itself.

The Ocker-Myers Method

It is a foregone conclusion then that some other means must be established which will give the pilot something

(Continued on next page)

RIGHT THROUGH!



The WHISTLER laughs at seaweed, mud-flats or logs. It's a five-passenger, 23 ft. Runabout that travels at 30 m.p.h. wherever there is five inches or more of water. Stable, seaworthy, safe and easy to handle. Fine for a thrill, for comfort, for family use or for commuting. Custom built at $4350 with 90 h.p. engine. Also closed cabin types with speeds up to 55 m.p.h. Address—
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Endicott Forgings were used in the construction of this great flying boat.

Endicott Forgings were used in the construction of every American built record breaking airplane during the past year.

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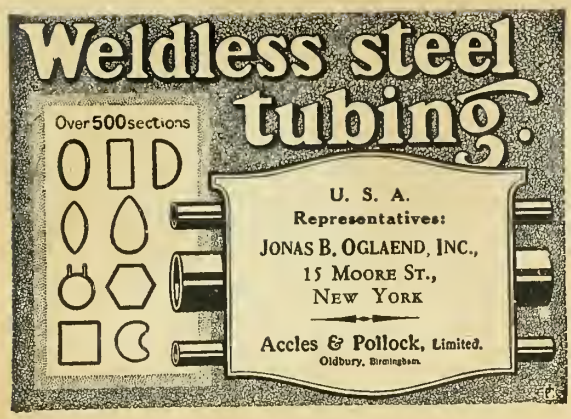


Groundman or Mechanic *Civilian Flyer*

Made of silver or gold front (Actual size shown above.) Pins or lapels. Price, $1.00 each, mailed anywhere. Identification Wristlets, $2.50.

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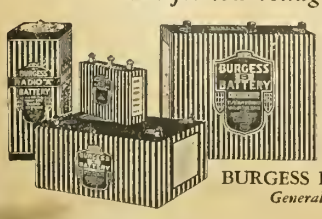
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(Continued from preceding page)

natural or artificial by which to check his reactions. In short, if we can furnish him with an artificial horizon when he flies through fog he will, when making the proper and intelligent use of such, be able to go anywhere in safety. Such an artificial horizon can be created for the pilot today if he will equip his plane with the instruments necessary to produce it. The artificial horizon itself must be visualized. This can be done by correctly reading and interpreting the instruments.

The essential instrument with which to mentally visualize the horizon is the bank and turn indicator, or any instrument that will give the pilot the position of his plane with respect to the horizontal and the perpendicular. The other instruments necessary are the compass, the air speed indicator and the inclinometer.

Ocker and Myers are the men responsible for the method to be used by the pilot which will aid him in properly visualizing the artificial horizon. By the study of "blind flying" accidents and practical as well as empirical research they have proved conclusively that their system in operation will overcome the dangers of present "blind flying." To express the method in one concrete sentence—the pilot must, when "flying blind" use his instruments as well as his acquired flying sense in creating an "artificial horizon" and he must not fail to remember that he cannot, as yet, depend upon his natural flying sense alone to guide him.

A great deal of controversy has been created in aviation circles, especially among pilots, as to the soundness of the findings of these two men. New methods in any line of endeavor lead to discussions both pro and con but the pronounced fact which tends to establish the soundness of the Ocker-Myers system is—that of approximately fifteen hundred pilots examined by Captain Myers *all* were found to react in the same manner to his tests. These tests are in substance the same as those above mentioned for maintaining equilibrium while on the ground. A few of the pilots examined were inclined to doubt the soundness of the Ocker-Myers method, claiming that the physical conditions produced in the test chair did not hold true in the air. However, they later admitted their error after testing the method in the air.

A few well known names of men who use the "artificial horizon" are: Lindbergh, Byrd, Maitland and Hegenberger, Smith and Bronte, Costes and Lebrix, Wilkins and Eielson and Martin Jensen. There are others too numerous to mention.

Further weight is given to the soundness of this method when we learn that the pilots of the west coast airways are to the last man users of the "artificial horizon." Anyone familiar with the fog conditions that these men have to combat during certain months of the year on the west coast can fully appreciate the significance of this statement. It is quite evident then that the fliers who have had an opportunity of testing this method are convinced of its value as an adjunct to safe flying as well as scheduled flying.

The objections that exist today as to the soundness of this method can be said to rest upon two things—lack of proper understanding of the method and a reluctance on the part of the old flier to accept the new. The existence of this prejudice and misunderstanding is due, in part, if not wholly, to the fact that those writers who have attempted to explain the Ocker-Myers method failed to emphasize the essential feature of it which is that Ocker and Myers are not attempting to revolutionize present flying methods by making "instrument fliers" of the existing stock of pilots today but what they do advocate is that the pilot must make use of his instruments at all times when

"flying blind" to obtain the proper interpretation of his physical reactions and so create for himself an "artificial horizon." When his bank and turn indicator tells him that he is turning left he must believe it and not his own feelings which lead him to believe that he is turning right. Ocker and Myers further presume that the flier by following this method will eventually develop a "blind flying" sense of equilibrium that will be comparable to his present true sense of balance which functions so dependably under clear weather conditions. Experience is the essential factor that determines to what degree of perfection the individual will develop his senses. Is it not then reasonable to surmise that it will hold true regarding this new environment man has created for himself, namely flying?

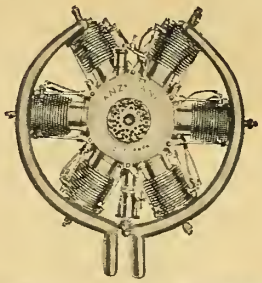
There are many instances of "blind flying" failures which could be narrated but one tragic example will suffice. It is the story of Captain Bill Erwin and his navigator, Alvin Eichwald. All of us are acquainted with the circumstances which resulted in the death of these two men but not all of us realize what Erwin and Eichwald have done to advance the science of aviation. They unknowingly furnished us with valuable data relative to "blind flying." Erwin and Eichwald got off to a good start in the Dole race of last year. A few miles out from the Golden Gate the *Dallas Spirit* developed trouble which forced it to return to the mainland and it dropped out of the race. Later, this plane started west across the Pacific in search of other Dole entries known to be lost. Erwin's plane was equipped with radio. The plane was heard from at regular intervals up to the time that it crashed into the sea. This crash occurred at night and in fog six or seven hundred miles at sea in an area that is known to have turbulent and disturbed air. The last message from Erwin and his navigator were that they had fallen into a tail spin, had righted their plane, and then the final unfinished message, "We're in ano. . . ."

Those of us who were listening in on the story of that flight and are today acquainted with the Ocker-Myers method firmly believe that we know the logical solution of the cause of the disaster of the *Dallas Spirit* and her crew. The first spin was the result of Erwin's failure to interpret his reactions to a "rudder turn" of the ship. The turn which started as a result of the action of the disturbed air on the plane was intensified by Erwin when he, feeling that he was turning in the opposite direction, kicked on more rudder. This turn stalled the heavily laden *Dallas Spirit* and the result of a "stall" is well known. Upon coming out of the first tail spin Erwin again received the perfectly natural sensation of turning in the opposite direction and to avoid a second spin he nosed the plane down and virtually flew it into the Pacific Ocean.

Captains Ocker and Myers have not asserted that the pilot is likely to find himself landing vertically on a precipice nor have they been responsible for other wild imaginings of the human mind such as the statement that the pilot would not know when he was flying up-side-down in the fog. They do claim and have proved that a pilot cannot depend upon his so-called "instinctive flying sense" to guide him under "blind flying" conditions. Further, their method is not an addition to air navigation but an aid to piloting or control of the plane when in the air.

If air transportation is to succeed and supersede the present methods of fast travel it must adopt some means of combating the delays due to inclement weather conditions. The planes of the near future must operate with safety and on schedule if they expect to receive and hold the patronage of the traveling public.

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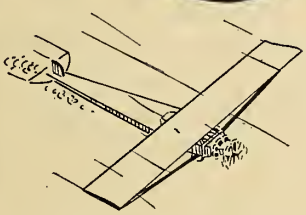
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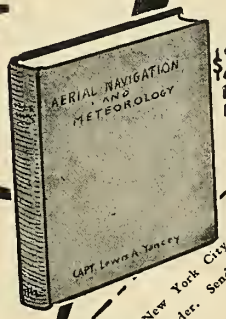
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- DEPENDABLE AIR TRANSPORT

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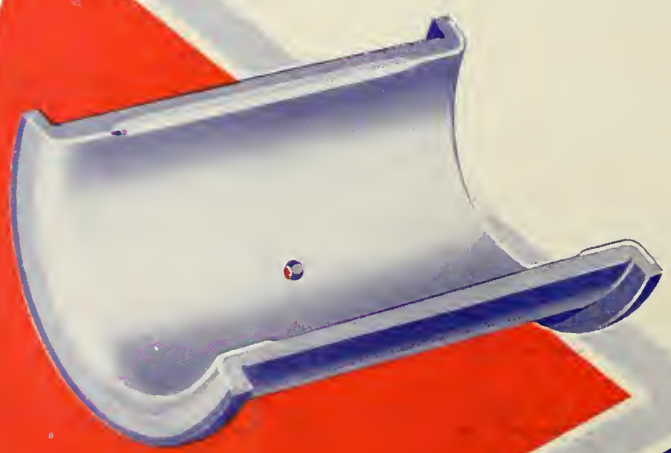
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Captain A. Raymond Brooks, who is in charge of the experimental flying of the Bell Telephone Laboratories, has had an extremely active and distinguished career in aviation. Captain Brooks was officially credited with the destruction in combat of six enemy 'planes during the World War.

★ ★ ★

The opinion of one qualified by extensive experience in aviation to pass judgment on the performance of an aircraft engine is both instructive and valuable. Before you buy an airplane, consider carefully the power unit — if it be a low-powered commercial, pleasure or weight-carrying 'plane, realize that *proof of* Fairchild Caminez* *performance* is in knowing first hand.

For Caminez particulars, write the Fairchild Caminez Engine Corporation, Farmingdale, Long Island, N.Y.

SUBSIDIARY OF FAIRCHILD AVIATION CORP.

HADLEY AIRPORT
NEW BRUNSWICK, N. J.

May 26, 1928.

Major Talbot O. Freeman, Vice-President,
Fairchild Caminez Engine Corporation,
Farmingdale, Long Island, N. Y.

Dear Sir:

Your claim of 40% increase in climb as a result of half-speed propeller efficiency seems absolutely justified.

Through the kindness of Leslie Cooper and "Dan" Beard at Curtiss Field, I recently had the opportunity of flying a stock "Cam" Engine Travel Air 'plane for an hour and a quarter, every minute of which I enjoyed thoroughly. With proper installation your Caminez engine surely gives a smooth, constant flow of power with as little vibration as any engine I have ever flown.

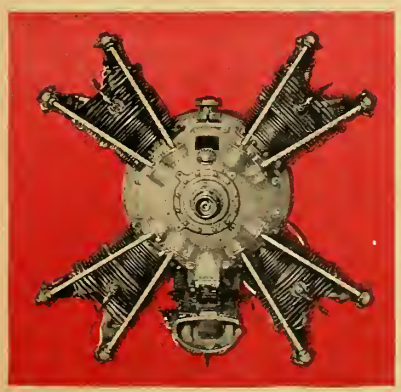
The take-off was remarkably quick and gave me the impression that the 'plane was in flight after a 100 ft. run. The climb to 2000 feet which followed was at a very rapid rate due to the high propeller efficiency. The engine revolutions were then tried from 800 to 1100 in dives, slips and climbs, and the continued smoothness of all engine speeds was apparent.

At 850 r.p.m. the air speed indicator registered 75-80 miles per hour in level flight. This low r.p.m. coupled with a stated gas consumption of 7 1/4 to 7 1/2 gallons per hour is a combination to be desired and is one reason, I presume, for the phenomenal demand for Fairchild Caminez Engines.

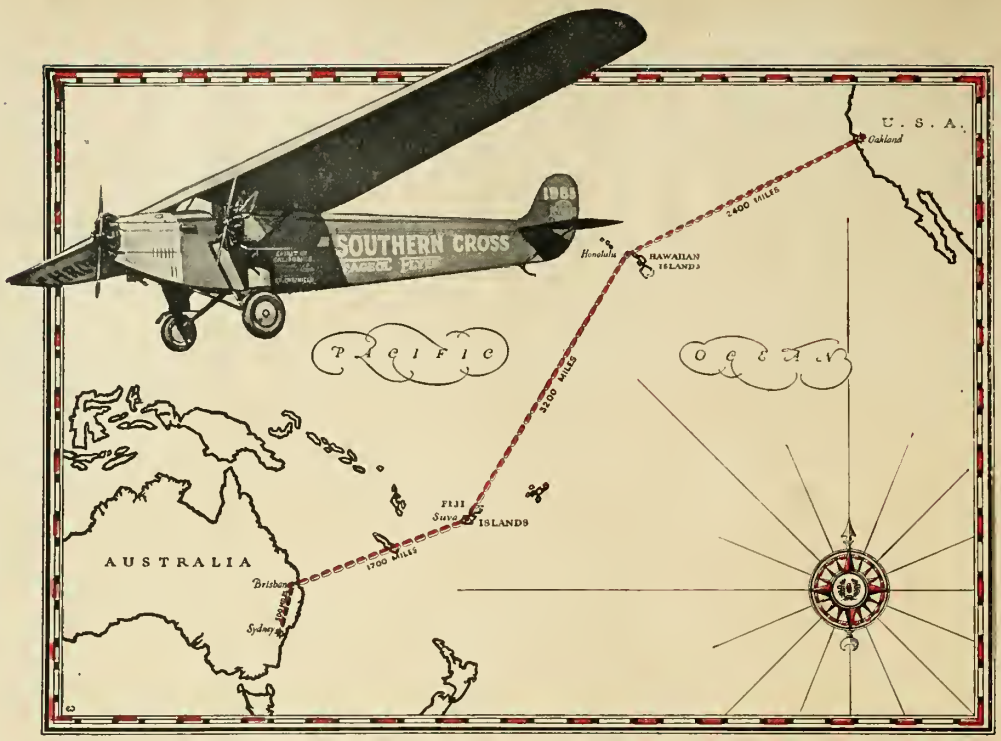
Sincerely yours,

A. Raymond Brooks

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CAMINEZ ENGINES



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lands victoriously in Australia on Silvertowns

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Goodrich

Captain KINGSFORD-SMITH

Pilot of the Southern Cross Writes...

March 26, 1928

B. F. Goodrich Rubber Co.
Akron, Ohio

Gentlemen:

The 44"x10" Silvertown Airplane Tires carried on my Fokker F-7 Plane have given me such remarkable service under very strenuous conditions that I believe you will be interested in having my unqualified endorsement for your airplane tires.

For your information, during my flights in San Francisco in December and January, this set of tires carried the loaded plane weighing 15,200 pounds off the ground and on the fifth time took off with 15,800 pounds. On the endurance flights in San Francisco, our first attempt, we stayed in the air forty-nine hours, twenty-eight minutes and two weeks later stayed up for fifty hours, seven minutes, breaking all records at this time for continuous radio communication with land. The weight lifted broke all existing records for weight per square foot of wing area and horse power—(this plane has a seventy-three foot wing spread).

I am very glad to give you this letter as an expression of my opinion of your Silvertown Airplane Tires.

Very truly yours,

CHARLES KINGSFORD-SMITH

We congratulate Captain C. T. Kingsford-Smith, and also Captain Charles T. P. Ulm, Relief Pilot, Lieut.-Com. H. W. Lyon, Navigator, and James W. Warner, Radio Operator, upon their daring, courage and ability. Their magnificent achievement will ever be remembered.

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The new company will be under the direction of the officers of Chestnut & Smith Corporation, and will have its head office in Tulsa, Oklahoma, with a plant at Westwego, Louisiana (on tide water), fully equipped for the manufacturing and storing of Naturaline, the super aviation motor fuel. The Naturaline Company will have as its purpose the sale of Naturaline (both domestic and export) but is organized for further research and development of the fuel problems of aviation.

The above group of natural gasoline manufacturers have generously pooled their research and develop-



Announce

The Naturaline Company OF AMERICA

ment activities in this one company dedicated to the purpose of keeping fuel efficiency apace with the rapid stride that aviation is making. It has become a matter of increasing importance to flying that the maximum values of gasoline be released for greater efficiency and more economical service than heretofore. Naturaline has thus far measured up to the highest expectations of experts and users, but the Naturaline Company, through its research department, will continue to work on any and every problem of fueling that the future may develop.



Nauraline is made from natural gasoline. It is a non-corrosive, even-burning, quick-starting aviation motor fuel one-half pound per gallon lighter than U. S. domestic grade aviation gasoline. It will now be sold under The Naturaline Company of America.



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Seattle, Washington

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BA56

Say you saw it in AERO DIGEST

It was hot enough to boil eggs

yet his motor kept in perfect action with Kendall Penzbest Oil



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Gasoline and Oil Available on our Field
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BRIDGEVILLE, PA.
March 24th, 1928.

Kendall Refining Co.,
Bradford, Penna.

Gentlemen:

I returned yesterday from San Diego with the new RYAN and was very much pleased with the action of same. I flew the entire distance with perfect ease feeling my motor was in perfect action with Kendall "G" Oil.

It is the best oil I have ever used. I started out through the desert and the temperature was so hot it seemed to me that it would boil eggs. The temperature was always in the neighborhood of 110 degrees.

My oil pressure dropped back about three pounds and it never reached over 140 degrees Fahrenheit. I used considerably less Kendall Oil than any other make I have used in like trip.

It is indeed with pleasure that I recommend Kendall "G" for use in Whirlwind Motors.

Yours very truly,

MAYER AIRCRAFT CORPORATION,

By J. Warren Smith

MANAGER & CHIEF PILOT.

AGENTS FOR

TRAVEL AIR MFG. CO.

Manufacturers of Travel-Air Planes

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Try Kendall Penzbest on your next flight. Your engine will perform better regardless of the weather. You will check all risk of trouble due to inferior lubrication. Starting will be easier, compression improved, power increased. If you would like to know the "hows" and "whys" .... let us send you a copy of *Ground Flying on the Subject of Lubrication. Address* Aviation Division, Kendall Refining Company, Bradford, Pa.

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The Curtiss Falcon, two-place observation and attack ship, used by the Air Corps, U. S. Marines and the National Guard;

The Condor, latest type of Air Corps bomber with its great performance, now under construction for the U. S. Air Corps;

The Fledgling, the result of design competition throughout the industry, selected for primary and advanced training by the U. S. Navy.

Engines

The D-12, standard high-performance engine of the services;

The Curtiss "Conqueror", 600 H.P. direct drive and geared;

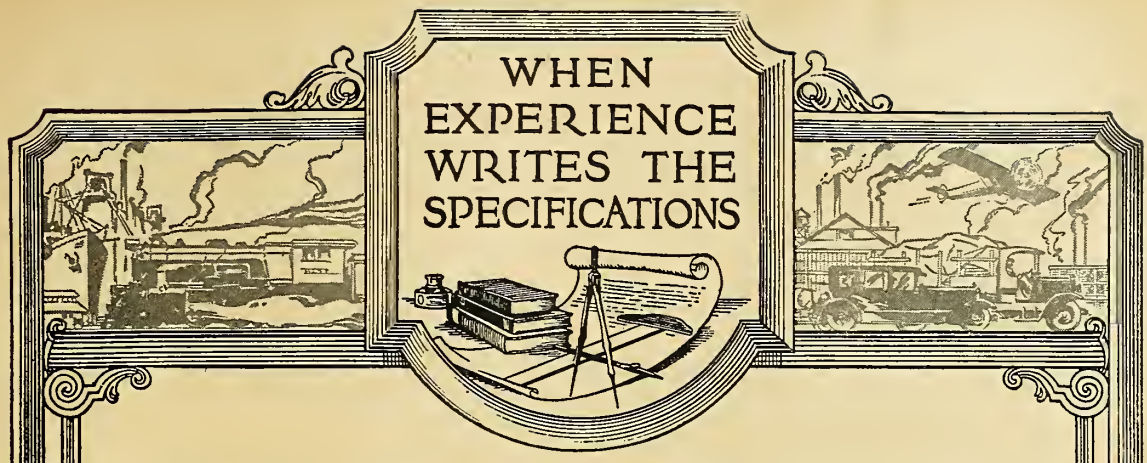
The Curtiss "Chieftain", latest air-cooled 600 H.P. motor, now in production.

Curtiss, with its background of more than twenty years of engineering and manufacturing experience, is now directing its interest to the commercial field. New types of planes, large and small, new types of engines, both water-cooled and air-cooled, are being produced, under the same group engineering system that has been responsible for Curtiss Leadership in military aviation.

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Visit our exhibit at the National Air Races at Los Angeles in September.



CURTISS AEROPLANE & MOTOR CO., INC.

USE NICKEL ALLOY STEEL FOR VITAL PARTS OF CURTISS D-12 ENGINES

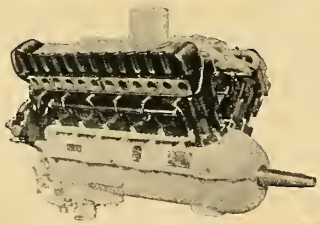
NICKEL ALLOY STEEL PARTS OF CURTISS D-12 ENGINE

- Crankshaft
- Connecting Rods
- Connecting Rod Bolts
- Camshaft Driveshaft
- Magneto Driveshafts
- Pumps Driveshaft
- Oil Pump Shafts
- Water Pump Shaft
- Vertical Driveshaft
- Pistons
- Gears
- Nuts
- Thrust Bearing Locknut
- Studs
- Piston Pins
- Wrist Pins
- Bolts
- Propeller Hub

THE First Pursuit Group, U. S. Army Corps, equipped with Curtiss "Hawks", powered by Curtiss D-12 Engines, is the crack Pursuit Group of the U. S. Army Air Corps. Nineteen of these pursuit planes recently made a flight from Selfridge Field, Detroit, to Kelly Field, Texas—1,400 miles in approximately 13 hours. They flew on schedule in perfect formation in poor weather, without a single mechanical breakdown in any motor.

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Information regarding these uses of Nickel Alloys will be gladly furnished by our staff of engineers.



435 H. P. Curtiss D-12 Airplane Engine



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Weight fully loaded	1,450 pounds
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Landing speed	40 miles per hour
Rate of climb	650 feet per minute
Cruising range	5 hours or 430 miles
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D O U G L A S

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HIGH in the heavens, on a job where duty permits no turning back, the pilot sure of himself and certain of his steed, hurls his swift courier of the mails into the teeth of the storm's terrific headwinds with full confidence in his ship's ability to deliver the mail safely at its destination. His plane was built by Douglas!

Before this situation arose, Douglas won the plane's battle against nature's whiplash fury. In the Douglas shops a master craftsman, possessed of a keen eye and a steady hand played a needle-pointed blue flame over the fusilage clusters welding them into one solid piece, granting superior stamina.

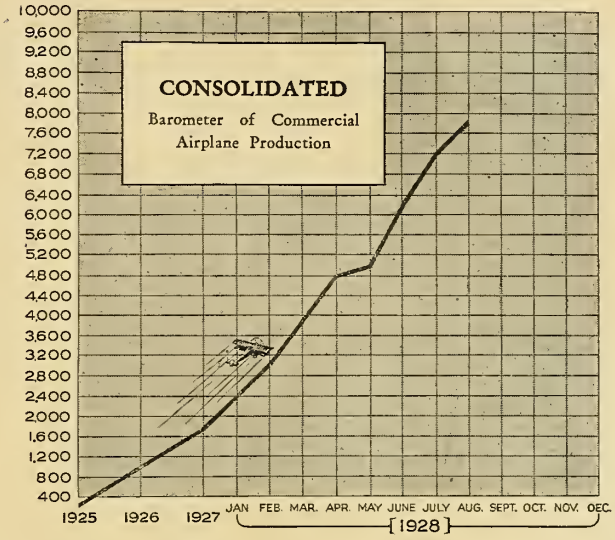
In that weld, important as it is, yet a detail in the plane's construction, lies the symbol of the Douglas organization. Not only is it the material expression of Douglas' determination to overcome nature's resistance, but it is typical of the spirit of co-operation permeating the entire institution welding its personnel into one complete unit with but a single objective—to serve faithfully, and thus build well. Esprit de corps stresses again the fact, *Douglas means Dependability.*

T H E D O U G L A S C O M P A N Y

Santa Monica *California*

THE accompanying chart visualizes the constant growth of airplane production . . . and the present approximate rate of manufacture (planes per 12-month period) . . . as indicated by the current delivery schedule of Consolidated Instruments.

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TYPE F Star Pathfinder compass, flush mounting, with easily accessible compensating unit.

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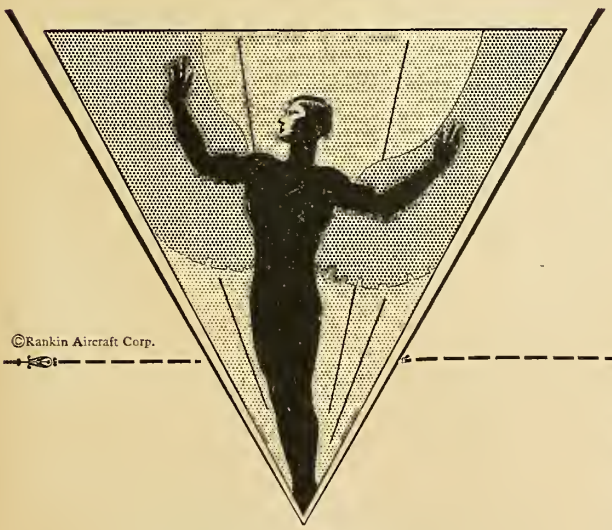
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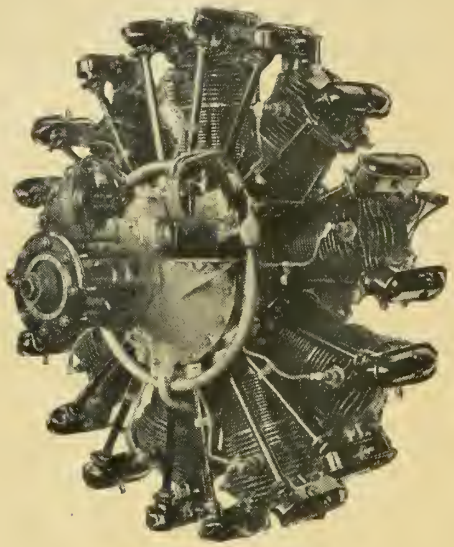
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AS the result of an extensive survey of present selling methods in the industry, International announces an entirely new sales policy of great interest to distributors and dealers, and to many who formerly could not enter the lucrative airplane sales field, such as field operators, flying instructors, etc.

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THE GOODYEAR TIRE & RUBBER COMPANY, INC., AKRON, OHIO

GOODYEAR

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AIRPLANE TIRES



SPREADING YOUR COSTS THIN

DID you read the bulletin issued by the Aeronautics Branch of the Department of Commerce, dated April 30th, discussing airway operation costs? There's much food for thought in it.

For example, two operators of single-engined, five-passenger planes nearly agree on costs, one giving a figure of 84 cents per plane mile, the other 87 cents. These show a cost per mile per passenger of about 17 cents, which the passenger must pay, of course.

The high cost, to the passenger, of flying from here to there is one of the chief reasons more people do not fly. Bringing down the cost is one of the quickest ways to increase business. There's no room for doubt about that.

Granting that even perfect management can't bring plane-mile costs down, there still is a way to bring down the cost to the passenger. And that's by spreading the cost over more people.

The same government bulletin gives a cost of $1.18 per mile for tri-motored planes. Higher than single-engined, naturally. But the Ford tri-motored transport spreads the cost over twelve passengers, bringing the charge on each individual down to 9.8 cents per mile. Quite a reduction! About double railroad fare plus Pullman. And more than twice the speed!

Charges like that will fill your planes. Think it over. Small ships may be holding your transport service back because your service must be limited to those who can pay extravagant fares. Every cent-per-mile you can cut your charges makes more customers for you.

We'll be glad to tell you anything we can about the cost of operating Ford tri-motored, all-metal transports. Write to

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Division of
FORD MOTOR COMPANY
Dearborn, Michigan

Volume 13
No. 2

AERO DIGEST

AUGUST
1928

THE MAGAZINE OF THE AIR

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"Air transport and its 100 mile an hour speed contrasted with the 35 to 40 miles for trains is the answer to the demand of business and the public generally for speed."

DEPENDABLE AIR TRANSPORT IS WITH US RIGHT NOW

By Harold Crary

Manager, Information Service Bureau, American Air Transport Association

THIS country's air transport, of which the air mail operations are the keystone, is not a thing of tomorrow, but of *today*. It is the new tool American business is capitalizing on in its ceaseless fight against time and space.

The casual observer who views air transport as a spectacular, once-in-awhile mode of transportation just on its way to its destiny as an everyday, practical system of transportation, will open his eyes if he will only survey what air transportation is actually doing *now*. Today there are approximately 34 mail, passenger and express routes either in operation or scheduled for operation over approximately 14,500 miles of airways with a daily mileage of approximately 32,000 miles. In 1927 the air transport operators flew approximately 6 million miles, an increase of 1,700,000 over 1926. This record is a tribute to the Government Bureaus, the companies and the individuals active in developing commercial aviation.

How does this growth compare with that in other countries? These figures tell the story.

Airplane miles flown in transport operations on regular schedule in the United States and other countries in 1927:

United States	6,000,000	France	3,500,000
Germany	5,500,000	British Empire	2,000,000

This record is outstanding because this country's splendid network of air mail and transport lines are operating without subsidy from the central government. France, in 1928, allowed 218,174,140 francs for civil aviation of which 115,000,000 francs is for premiums and subsidies. Germany, in the present fiscal year, is appropriating 19,750,000 marks for air transport subsidies. The British Government is liberal in appropriations to subsidize air and transport lines. In the past seven years the government spent 1,382,780 pounds in certain direct aids to operating companies. In recent years the British Government has paid one company 137,000 pounds annually as a direct subsidy for operating between Great Britain and the Continent. This company receives another subsidy for its services between England and Egypt. From 1928 to 1934 this company will receive a subsidy graduated down from its present grant. Airplane clubs in England can obtain grants for organization and maintenance, when they meet certain requirements. Other foreign governments have definite policies of subsidy.

Our Federal Government, which pioneered this country's present organized commercial aviation system when the Post Office Department started the first air mail route between New York and Washington in 1918, has eliminated itself from operation of routes. Future development promises to develop from private enterprises working in harmony with the many branches of the Government now aiding aviation. The Federal Government is committed to the policy of confining its aviation operations to military needs. The effective pioneering work done by the Post Office Department in building up a substantial air mail business, including that over a transcontinental route, the largest air mail route operated on a daily schedule in the world, was an effective aid to our present day commercial aviation. The private operators, since September 1, 1927, which marked the complete retirement of the department from the operating field, have shown commendable enterprise in developing new business and in opening up new routes.

At the present time the air mail contractors operating over 19 domestic and 3 foreign routes totalling 10,239 miles, are flying approximately 21,000 miles daily and before the first of the year, because of the addition of new routes, the air mail companies will be flying daily a mileage equivalent to the distance around the world. The air mail planes have flown more than 17 million miles since the service was begun with the shuttle between New York and Washington 10 years ago.

Our air mail companies are not only leading other nations in mileage flown, but also in the mileage of lighted airways. On June 30, 1928, the lighted mileage of mail airways was 7,698 miles with 910 miles additional airways equipped with intermediate fields and markers for day flying. There remain 7,211 miles of unlighted airways pending under contract or actually operating. During the year ending June 30, 1929 the Government plans on lighting 4,000 more miles.

Hand in hand with lighting the airways has gone the development of radio weather reporting and communication stations, which total 17 on the transcontinental route and 2 on the route linking Salt Lake with the Pacific Northwest. The Department of Commerce is giving generous encouragement to lighting airways, a big factor in the speeding up of air transportation. With the completion of the lighting system for the western end of the route, mail and express will be transported between New York and the Pacific Coast with the loss of only one business day and similar savings are possible on other lighted routes.

The safety and reliability of the air mail service is shown by the number of the original air mail pilots who are still in the service. Four air mail pilots have more than a half million miles of air mail flying to their credit. A number of them are now crowding the mark of 5,000 hours aloft in air mail planes.

While the facts and figures cited above may appear to be cold statistics, there is plenty of interest and color in the narrative of how air mail and transport are rapidly revolutionizing certain business practices. Every time this country has had a major change in transportation, from Indian runner to express rider to stage coach to train to automobile, there has been also a major change in methods of doing business and in our social customs. The day of the airplane is here. It will work equally drastic changes in our business standards.

Commercial transport enjoyed an upward swing in 1926. This up-turn, fanned by Lindbergh's great flight which aroused this country to aviation, was even more marked in 1927. When the history of aviation for 1928 is written it will be found that commercial air transport in this country is systematically jumping barriers and developing along logical lines and at a rapid pace.

Air transport and its 100 miles an hour speed contrasted with the average of 35 to 45 miles for trains is the answer to the demand of business and the public generally for

speed. This is the day of small stocks and quick turnover and much service and little profit. Industry is not satisfied to take two business days to complete a transaction which can be done in one day by using the airplane. Today corporations doing a national business are able to centralize their operations, save money, keep in close touch with the trade and expedite their operations generally because the air mail lines serve 62,000,000 people directly and millions more indirectly.

As speed is the essence of air mail service the saving in time and money reach a stupendous total in a year. Such a saving cannot be overlooked by the modern business man. If he does he will surely fall behind in the race.



Above—Passengers departing from the Ford Trimotor at Cleveland. Below—Loading mail and express in one of the Douglas mail planes.

Savings in Time by Air Mail Service

(Hours only)

	Trains	*Air Mail*
New York to San Francisco	83	31
Chicago to New York	20	9
St. Paul to Dallas	37	17
New York to Atlanta	24	10
Boston to Cleveland	16	9
Los Angeles to St. Louis	60	26
Youngstown to Des Moines	20	8
St. Louis to St. Paul	18	8
Los Angeles to San Francisco	12	4

What will happen to the bank, bond house, manufacturer or the retailer who sticks to train transport mail and his alert competitor reaches competitive markets 12, 24, 48 or 72 hours ahead of him by using air mail when the difference in postage, under the new rate effective August 1, is only 3 cents on the average business letter? Modern business methods prohibit, especially in view of the new low air mail rate, the extra 52 hours required to transport communications by train when there is daily dependable air mail and express service between New York and San Francisco. That saving can be duplicated on routes all over the great network of air transport. No wonder then more and more executives are asking "Where does air transport fit into my business?" The following examples, selected from hundreds of instances, show how alert business men appreciate this modern method of transportation:

A New York hat manufacturer mailed 5,000 circular letters to the trade over the country advising that a special lot of four hats would be sent them air express in a special box for window display. These hats bore the titles "Spirit of St. Louis", "Pride of Detroit", "Bellanca" and "America." The idea took hold. He soon sold 1,000 sets of four hats each, all sent air express. Each box contained four hats and weighed one and one-quarter pounds. The average air express cost was 62½ cents for each hat.

A Milwaukee manufacturer recently sold a cargo of locks in the New York market. By shipping via air, a thousand miles away, he put his locks down in New York as fast as his competitors could have delivered them from New England. . . . A consignment of flowers was flown to New York, so that they might arrive with the bloom of California fresh upon them. An inter-mountain florist is sending daily shipments of sweet peas to Middle West retailers. . . . Shippers of oil from California to the Atlantic Coasts save thousands of dollars in interest by forwarding bills of lading via air.

Alert buyers scour the New York market for the latest and each night the West and South and Northbound planes from New York carry models of hats, gowns, lingerie, for Boston, Chicago, Atlanta, St. Louis, Minneapolis, Seattle, etc. Buyers attempt to steal a march on their competitors by getting the new designs in their stores first.

Air transport insures an overnight replenishment of stocks. Consequently, smaller inventories can be carried. Should there be a delay in receiving shipments to keep stocks up to requirements, the air transport service is the emergency method to fall back on. As soon as the business man appreciates the fact that he can reduce his investments in stocks carried because he is always sure of what air transport will do if he runs short, hundreds of



Ford Trimotor used on the Maddux Air Line.



Travel Air monoplane used for mail and express.

thousands of dollars will be saved a year to American business through the carrying of smaller inventories.

Repair parts for a threshing machine in Nebraska to save the payroll an idle crew would receive; a forgetful husband who delayed friend wife's birthday present until too late for the regular mail; a belated package for a traveler about to board ship for foreign ports; photographs of important news events—and so on through a surprising diversity of shipments, via air transport. The half million letters carried daily by air mail are supplemented by a growing volume of parcel mail and express.

An important repair part for a water plant located on a rail line out of San Francisco was recently forwarded from Canton, Ohio, connecting with a mail plane at Cleveland, from which point it was handled by air to San Francisco, thence by rail to destination. The air express service in this case saved about three days' time and enabled the plant to resume operations before the reservoir's reserve was exhausted and thereby avoiding a serious calamity.



Boeing passenger and mail plane.

A Dallas firm of contractors used the air mail to advantage in preparing bids for a court house. It was necessary to send the plans to a marble contractor at St. Paul for an estimate on the cost of the marble. The plans left Dallas on Saturday, were received in St. Paul Sunday afternoon, having been sent air mail, special delivery. The Dallas firm had the estimate and plans back in Dallas before Wednesday.

An example of service which the air mail lines are giving daily is reported by an investment firm in Fort Worth, Texas. On February 10 the firm completed negotiations with a banking house in Chicago for the issuance of bonds to be offered February 14. Late the same day, Friday, the copy for the circulars was forwarded to the Chicago financial institution. The circulars were printed in Chicago before noon Saturday and were delivered to the Fort Worth firm early Monday morning, air mail being used to and from Chicago.

Time is money, and who knows that better than the banker or financial institution executives, the largest single users of air mail today? Bank clearings in the Middle West today, by the use of air mail, clear in Wall Street tomorrow. Three days' interest is saved by Pacific Coast and inter-mountain banks and investment houses who send negotiable paper and securities by the air route.



Fokker F-10 fourteen place transport.

Twenty-four million dollars now goes air transport to Wall Street daily, representing the face value of checks sent from all over the country to New York correspondents for deposit, loans on call or other purposes. Utilization of the air mail brings the checks to the nation's financial center at the New York clearing houses from one to three days ahead of train mail. Thus interest is saved for one to three days at the rate of three to four and a half per cent. In a year capital arriving in New York by air mail is estimated at $7,200,000,000. If only 2 per cent is saved thereby, the amount involved amounts to one hundred and forty-four million dollars.

These are but examples of the varied ways air transport is being utilized by a growing number of business houses, ranging from banks to manufacturers. Air mail and express will enjoy a marked increase in business when the public appreciates the advantages of the new low rates which have just gone into effect.



The new Curtiss Falcon mail plane.

Postage on a letter weighing one ounce will be reduced 75 per cent and there will be a reduction of approximately 50 per cent on mail weighing over one ounce. On a package weighing a pound, the air mail postage charge will be $1.55 instead of $3.20. On a two-pound package, $3.15 instead of $6.40 as heretofore, etc. This reduction is heralded as the greatest forward step in the history of air mail, around which we are building commercial aviation.

Several large national concerns have already made plans to effect drastic changes in their method of business when this new rate goes in. One Middle West concern purposes to abolish a mountain state distributing office. It will mail out its light weight parcels by air transport when it receives air mail orders from the west, direct from its main factory, thus doing away with keeping double stocks, two sets of books, and working other economies.

This is but an instance of how American business, quick to capitalize on any new service, proposes to take advantage of the speed and economy offered by our air mail service.

MY AERIAL VACATION

By Don Rose



MY wife has made up our mind that we should take a vacation. There was a certain amount of friendly but animated discussion about it, but it seems that the final decision was unanimous. We decided to break open the children's banks, borrow on my insurance policies, sell the grand piano, and have a real vacation.

I took the matter up with the editor of AERO DIGEST in fear and trembling. I hated to go off this way and leave him practically alone and unaided in his fight for the freedom of the air. If it wasn't for the little woman at home, I doubt if I could have broken the news to him at all. An editor has so many troubles; it seemed positively cruel to add to them.

"If you please, sir," said I, "I should like to take a few days off, if you don't mind. Just a couple of weeks. You see——"

"Take two months," he said, without looking up from his game of solitaire. "Take three."

"No, no," I protested, "I wouldn't think of it. But I've been married to my wife for fifteen years, and curiously enough she has been married to me for the same length of time, and I would like to take a nice long trip with her. I've been promising it, on and off, for fifteen years—maybe more."

"You're a promising young man," he said, cheating a little at his solitaire. "Take a nice long trip. Go to Kamchatka, for instance. Go to Sarawak. I think you left your hat in the outer office."

So that was settled. The next problem was to decide where to go. I suggested a one-day excursion to Cape May. By rising at 4:15, eastern standard time, and flagging the milk train, we can make connections in the neighboring metropolis, which will dump us on the beach just in time to eat our sandwiches, take a swim, lose two of the children, find them again, and get home by midnight. It makes a nice long day, and you certainly see a lot of New Jersey.

The idea did not appeal to my wife. "I don't see any sense," she said, "in going all that way just to let the sun treat you like a fried egg. And besides, it always takes me three weeks to get the sand out of the children after a day at the seashore."

"Well," I retorted, "we are certainly not going down to your cousin's place in Vineland, N. J.—not in the peach season. Whenever we go there in peach season he puts me to picking peaches and packing them for market. I'd sooner go to the shore, where I can pick all the peaches I want but don't have to pack them."

"Don't be vulgar," said my wife. "We might go down to Philadelphia, of course, and see the Liberty Bell. Or to New York, to see the Aquarium. It's really time the children saw a little of the world."

"All right," I said, with rare humor, "let's make a trip round the world and take all the children."

Right then I saw that I had made a serious mistake. Whenever I toss one of my excruciatingly funny remarks at my wife, I get into trouble. She simply can't see one of my jokes unless I hit her on the head with it. I could see at once that she was beginning to take my casual quip seriously. This vacation idea was beginning to assume appalling proportions.

Now as far as I am concerned I am no glutton for vacations. I can take them or leave them alone. A week or two of fishing in the spring and perhaps a month in the Canadian mountains at the end of summer, with a dozen or so week-ends scattered through the year, is enough to keep me in pretty fair shape. But a regular vacation seems such a waste of time. You go away somewhere so that you can wear old clothes, sit in an easy chair, play bridge and cuss at the weather. I can do all that at home, and in fact I do.

But my wife had a far-away look in her eyes. "We might take a trip abroad," she suggested.

That struck me as a singularly poor idea. I know all about these trips to Europe. The only reason people go to Europe is so that they can come home again and lie about it for the rest of their lives. And even the novelty of it is gone in these modern days, when our boys and girls are making aerial excursion trips to Paris and Southampton between a light breakfast and a late dinner. You can't brag much about a European trip any more; it is just one of those things you must do and get over with, if you are to be tolerated by the neighbors.

It was not always thus. A few years back the transatlantic trip was fraught with both dangers and adventures. It was a pioneer era. The journey challenged the strength of age and the daring of youth, from the first taxi-cab to the last argument with the customs inspectors. Even college freshmen said goodbye forever to their families and found their way across as handmaidens to beef-bound cows. But today the trip has been made so easy that passports, visés, and travellers' checks had to be invented to restore the element of sport and difficulty to the undertaking. In these emaciated days, if you have any money you go to Europe; if you have no money you talk savagely about Seeing America First, and stay in your own back yard all your life.

To all my objections my wife replied that a little travel would broaden me. To this I replied that a little travel would certainly flatten me. She brushed this aside, and insisted that the family was going to have a real vacation if we had to put another mortgage on the chicken house to pay for it. I surrendered to my fate.

So we went into Committee of the Whole, and discussed where we should go. We got out a map of the United States and all insular possesions not to mention Canada and Mexico, and everybody put in their bids. Some wanted to go here and some there, and it got to be quite an exciting game. San Francisco, the Grand Canyon, Valley Forge, and White Sulphur Springs all received favorable attention. My wife has an aunt in St. Louis, the oldest boy wants to go to the Adirondacks, and I am keen to fish the streams and rivers of the Rockies. The Bluegrass region of Kentucky and the rocky coasts of Maine could not to be omitted. My

(Continued on page 360)

THE FROLICSOME BATTLESHIP

By Cy Caldwell

★ This is the second of a series of articles by Mr. Caldwell on the battleship as a weapon of national defense. Mr. Caldwell claims that the taxpayers of the United States are paying for protection in event of war which the U. S. Navy, as now constituted, will be unable to provide and will never be able to provide as long as they adhere to the belief that the backbone of the fleet is the battleship. Mr. Caldwell maintains that the development of the bombing plane has rendered the battleship absolutely useless in warfare. These articles will be reprinted and placed in the hands of every Senator and Congressman, and reprints will be available for public distribution. ★

The Editor.

IN *The Battleship Bubble,* published in the July issue of AERO DIGEST, I discussed the battleship solely with reference to its structural ability to remain afloat under determined enemy attack, and presented many facts upon which I based my conclusion that the battleship could not remain afloat and in action after an efficient aerial bombardment, and therefore was an obsolete weapon of National Defense. In this present article I shall confine myself to a consideration of the battleship as a mobile unit, with special reference to its maneuverability and its power to dodge the attack of bombing and torpedo aircraft; and shall defer to a later article all consideration of the battleship's defensive armament and also of the ability of the airplane to inflict damage. My purpose in this article is to prove, mainly by direct quotations from naval authorities themselves, that the battleship is a sluggish and unwieldy vessel and that it cannot escape the attacks of aircraft.

But as I stated in my first article on the battleship, I desire no one-sided discussion of this matter. And I announce again that, at my request, the publisher of AERO DIGEST offers the use of these columns to any competent naval authority who desires to take issue with me and prove to me and to our readers that I am wrong when I contend: (1) that the battleship is an obsolete weapon; (2) that the Navy is wrong in considering it the backbone of the fleet; and (3) that in an engagement with a fleet of enemy aircraft, the battleship inevitably will be sent to the bottom. My only stipulation is that the present discussion be confined to the subject matter of these two articles—first, the inherent ability of the battleship to remain afloat under attack; second, the ability of the battleship to escape the attack of aircraft. Later articles (of which criticism also is invited) will discuss the subject of armament and the ship's offensive power, and also the powers and present limitations of aircraft.

The most modern American battleships are the *Maryland, Colorado,* and *West Virginia,* with a normal displacement of 32,600 tons, full load of 33,590 tons, length over all of 624 feet, beam or width of 97 feet 3½ inches, and maximum draught of 31 feet 7 inches. In other words, in order that a battleship of the *Maryland* class may float upon the surface it must displace 33,590 tons of water—an area of water 600 feet long, at the waterline, by 97 feet wide, and 31½ feet deep. The underwater area of the hull is about 72,000 square feet.

This is a tremendous amount of water, and a tremendous area of steel surface which must be driven through the water. For as the ship proceeds for a distance of 600 feet it must displace 33,590 tons of water ahead of it, while 33,590 tons of water close in behind it. I stress this point and beg that the reader will remember it as he peruses this article; for I believe that the popular conception of a ship's progression through the water is that of a long, slim shape gliding easily along, apparently without any great effort. Such is not the case. There is an actual weight of water to be moved aside—a weight of 33,590 tons in the case of the *West Virginia*—and the fact that an equal weight of water closes in at the stern has no bearing on the propulsive effort that must be put forth by the vessel if it is to move ahead.

This propulsive effort of the *West Virginia* is measured at 28,900 horsepower, and is produced by steam-driven turbine generating units which turn four propellers at a rate of 175 revolutions per minute. When it is realized that 28,900 h.p. turning four great propellers manage to urge the ship through the water at a rate of *only 21 knots per hour,* it will readily appear that my stressing of the enormous weight of water that must be displaced when the ship moves is justified by the facts. And in all of what follows regarding the maneuverability of a battleship, and its ability to dodge about on the surface of the sea under a rain of aircraft bombs, the reader is asked not to lose sight of the fact that in all this "dodging about" some 33,590 tons of water is being displaced constantly—*is being pushed aside*—and some 72,000 square feet of steel surface is being urged through the water, *against a tremendous friction.* And not only that. As the four propellers are driving the ship forward, they also are driving the water through which they are turning, backward. In other words, as the ship goes forward, the water at the stern is being driven backward—which, of course, sets up a great suction which further tends to retard the forward progress of the battleship.

But with all these natural disadvantages the battleship does move—at the very moderate rate of approximately 21 knots an hour. There is not a bombing plane built to-day which has a speed below 100 miles per hour, or *more than four times the best speed of which the battleship is capable.* So there is no doubt whatever that an airplane could *overtake* a battleship. In fact, the airplane could give the battleship over three hours' start—and still catch it within an hour. This fact is so generally recognized, even in the Navy, that there is no need for extended controversy on this point. But what is not recognized in the Navy is that the battleship *cannot possibly escape an efficient enemy in a bombing or torpedo plane.* The prevailing naval opinion seems to be that a battleship can *zig-zag* and *pursue such a twisting path* that the aerial bomber flying overhead will be completely baffled and thrown off his aim. This opinion is expressed by Mr. Hector C. Bywater in his essay, "The Battleship and Its Uses," which received the 1926 prize of the United States Naval Institute—which thus sets the seal of its approval on the matter contained in the essay. Mr. Bywater states:

"The modern dreadnought, so far from being slothful, can move through the water at a very respectable pace. In the British Navy there are dreadnoughts which steam at 31 knots—equal to 35.7 land miles an hour. They are, therefore, appreciably faster than the swiftest liners of to-day which are popularly known as 'ocean greyhounds.' The slowest battleships now in service are good for 21 knots. In the hands of a capable navigator it can be maneuvered as easily and surely as a yacht. To label such a vessel slow and clumsy is an abuse of words." Further on he says: "The battleships would be travelling at high speed on an erratic course, perhaps emitting vast

clouds of smoke. Peace-time tests offer no reliable indication as to the percentage of hits likely to be registered under the conditions here pictured. Bombs would be dropped more or less haphazard."

According to Mr. Bywater, "the slowest battleships now in service" must be the American battleships, for most of them come within the slow speed range of 21 knots. From Jane's *Fighting Ships* I take these speeds for American battleships: *Colorado, Maryland,* and *West Virginia* 21 knots, best recent speed; *California* and *Tennessee,* 21 knots; *New Mexico,* 21 knots; *Idaho,* 21.92 knots; *Pennsylvania* and *Arizona,* 21 knots; *Oklahoma* and *Nevada,* 20½ knots. The rest of the American battleships fall below 21 knots. Referring to Mr. Bywater's statement that, "In the British Navy there are dreadnoughts which steam at 31 knots," I have been unable to find trace of any such speedy battleships. The *Nelson* and *Rodney,* the latest British battleships, steamed 23 knots at their trials, which was all the speed they were designed to do. The *Royal Sovereign, Ramillies,* and *Revenge* did 21.6, 21.5 and 21.9 knots respectively on trials, while the *Queen Elizabeth* class of battleships was designed for 25 knots, and the *Iron Duke* class for 21. Perhaps Mr. Bywater includes battle cruisers with battleships—the *Hood* with 144,000 h.p. does 31 knots, while the *Repulse* and *Renown,* also battle cruisers, knock off 31.7 and 32.68 knots, respectively. However, as a fast battle cruiser in the *British* Navy is of very doubtful value to the *American* Navy, we may leave them out of this present inquiry which concerns mainly the ability of an *American* battleship, steaming only 21 knots, to escape from a bombing or torpedo plane going a hundred miles an hour.

Mr. Bywater—whose words received the prize of the United States Naval Institute and therefore may be regarded as being officially approved—has very little doubt that the battleship, "turning and twisting at high speed," and "maneuvering as easily and surely as a yacht" and "travelling at high speed on an erratic course, perhaps emitting vast clouds of smoke" would be such a baffling, speedy, elusive target that "bombs would be dropped more or less haphazard." I have taken some liberties with Mr. Bywater's phrases, by combining them into my own sentence. But the quoted phrases are his, and are joined merely to save space. I have taken no liberties with the sense of his text, which is as stated in my sentence. Nor am I selecting Mr. Bywater's essay as an object of attack. But the opinions which he has expressed are, I am convinced, shared by many of the senior officers in the United States Navy, who really imagine that a battleship is a most nimble vessel, capable of dodging here and there with all the abandon of a seal.

But what is the truth of the matter? Mr. E. F. Spanner, eminent English naval authority, says in his book, *Armaments and the Non-Combatant,* "The battleship is a massive and ponderous bulk and it is ridiculous to imagine that because the 35,000 tons she weighs is under Navy control, she loses the inertia proper to so great a weight immersed in water. A few figures from the official Admiralty *Manual of Seamanship* should serve to dispel some of the optimism which wraps itself about these officially inspired statements that battleships will be very elusive targets, and that they will be able to dodge aircraft bombs. In that volume we read: 'A battleship will attain 12 knots from stopped in from seven to ten minutes.' Think of it! It takes a battleship from seven to ten minutes to do what a motor-car can do in a little more than as many seconds. In the same volume: 'A battleship by stopping her engines takes about twenty minutes to reduce from 12 to 2 knots.' This bald statement may serve to give some faint idea of the immense clumsiness of these vessels. They take a long time to start moving at a respectable pace—twice as long to stop.

By reversing the engines, however, they can be brought to a stop in a much shorter space of time. The American battleship *Tennessee,* for example, was brought to rest from full speed within three minutes. But I must add that such an accomplishment would be of less than no value to a battleship in line of battle formation, were it to stop, or even slow down momentarily, in order to allow a bomb to fall ahead of it—for if it stopped, the battleship following behind also would have to stop, and the one behind that, and so on right down the line. Not to mention the ones ahead, that also would have to stop in order that the battle formation remain unbroken. But we will take up maneuvering in fleet formation later in this article. For the present, let us consider only one battleship, with special reference to its ability to dodge aircraft bombs.

Mr. Spanner quotes again from the Admiralty *Manual of Seamanship:* 'A capital ship (battleship) steaming at 21 knots with 35 degree of helm will have that speed reduced to 47 per cent at 16 points.' This means that when a battleship has turned a *'right-about' her speed will be less than half what it was before she started the turn.* Further, it will take her about *twenty minutes* to work up to full speed again. The fact that *admirals themselves are ignorant on these points* is proved by reference to the official narrative of the Battle of Jutland. The 5th Battle Squadron turned 16 points in succession in response to a signal from Vice-Admiral Beatty. The four ships were subjected to a severe fire from ships of the *Konig* class during the evolution and for some twenty minutes after. The official Narrative says: 'The 5th Battle Squadron in this phase of the action suffered severely, and its apparent inability with a speed of 25 knots to escape from the *Konig* class, which, though designed for only 20.5 knots, were expected to reach 22 for a short distance, gave rise to an exaggerated idea of the *Konig's* speed.' "It seems obvious," comments Mr. Spanner, "that the speed of the 5th Battle Squadron must have *dropped to about 12 knots* at the end of their 16-point turn; *fully twenty minutes* would elapse before they were again moving at their full speed of 25 knots. The compilers of the official Narrative seem at fault, for they say: 'The explanation lay, however, not in the speed, but the fact that the two squadrons were steering on converging courses. The superior speed of the *Barham* was never really in doubt, *for it never fell below 24 knots.*' There would appear sound reason for suggesting that that last statement is decidedly in error. It seems to show ignorance of the effect of helm action, and also a lack of knowledge of the slowness with which battleships accelerate through the water. The engine revolutions may have been suitable for 24 knots or even more, but the ships were a long time arriving at that speed through the water after the turn. The speed of the German vessels remained unaffected by helm action of course, as they were steaming throughout on practically a steady course.

The question may arise: Why did the ships lose speed when they made the turn? Please refer to my previous statement regarding the 33,590 tons of water that are displaced by the huge ship in its passage. When the ship is going straight ahead, the only resistance is due to the cross section of her hull and the suction behind the stern, which is more or less streamlined. When the rudder is put hard over to starboard, the stern will be forced over to port, which requires water to be pushed out of the way; and

the water will rush in on the starboard to take up the space of the water pushed out. Simultaneously, the starboard bow will push water out of the way; and the water will have to rush in on the port bow to take its place. Of course, this increases the ship's resistance to the water, for it throws one end of the ship one way, and the other, the other way; both the bow and the stern have to push water out of the way, and then have a suction on the other side against it to fill up the vacuum made by the turn. Consequently the ship is slowed down to less than half her straightaway speed.

But let us suppose that the battleship, having turned about once, should repeat the maneuver in order to return to her previous course. The speed, already reduced to less than half by the first turn, must then be reduced to perhaps a quarter by the second right-about. It may be said that the battleship would not require to use any such evolutions as full or half turns in order to dodge aircraft bombs, and that therefore her speed would not be reduced to such a pathetic figure — that the ship would not be turned sixteen points, but would be turned only a few points. However, if the ship kept on "turning and twisting" as Mr. Bywater suggests, would not the speed be greatly reduced, irrespective of the turning angle? Because it is obvious that the ship would only have to *keep on zig-zagging long enough* before it had piled up enough part turns to make in their entirety say two full circles. What, then, becomes of Mr. Bywater's battleships, "turning and twisting at high speed" and "travelling at high speed on an erratic course?" Will some competent naval authority kindly answer that question? Or will he admit candidly that a 21-knot battleship, after "turning and twisting at high speed" for, say, an aggregate of three full turns, actually is surging through the water at the staggering rate of about 6 knots an hour?



International.

British cruiser "Dauntless" wrecked in a fog last June on the rocks off Halifax. This cruiser, displacing 4,650 tons, is 465 feet long and cost over $4,000,000. It is now a total loss

This delusion about the speed of a turning battleship apparently is held by no less a battleship enthusiast than Admiral P. Niblack, of the United States Navy, who writes: "A bomb dropped from a height of 12,000 feet requires 28 seconds to reach the deck of a ship. A 21-knot ship moves nearly 1,000 feet on her course while such a bomb is in flight, and *if she zig-zags,* the difficulties of estimating the trajectory are tremendous." But if she zig-zags *often enough* and for *a long enough space of time,* reducing her speed with each turning maneuver, it is possible to arrive at a point where her forward speed is reduced to as low as 6 knots! In which case she would have moved only about 300 feet. As the battleship is herself 600 feet long, she would have moved only about half her own length in 28 seconds—and I can't at the moment see that it matters greatly which end of a battleship is hit. Either end may have a hole blown in it.

The report of the Hearings before The President's Aircraft Board in September, 1925, shows that the Hon. Curtis D. Wilbur, Secretary of the Navy, also is suffering under the delusion that a battleship successfully can zig-zag and escape damage from aircraft bombs. In a *prepared* statement which he submitted to the Board, Mr. Wilbur states: *"It is perfectly easy to sink a ship which has no water-tight compartments,* which is not prepared to resist an aerial bomb, which is anchored and immovable. . . . But *it is a vastly different problem to successfully attack a ship under way,* using its antiaircraft guns, *zig-zagging if necessary,* and so on." "And so on"—where? I would ask—and at what speed?

Before the same Board convened by the President, Rear Admiral A. E. Coontz, United States Navy, in speaking of the bombing of battleships, delivered himself of the following pronouncement: "If you tie a poor old dog over there in the corner of the room and throw rocks at him you will eventually kill him. But if he is left free *he will dodge around pretty lively.* . . . Now I do not pretend to say but what we are going to get more and more accurate in dropping bombs. At the same time *we are going to get more and more accurate in the matter of dodging them.*"

Here is a Rear Admiral of the United States Navy, a man who has spent his life in the Navy, and who should be familiar with the turning movements of battleships, appearing before the President's Aircraft Board and suggesting by analogy that a battleship in action "will dodge around pretty lively" *which it certainly will not,* because *it cannot.* And Admiral Coontz believes, moreover, that battleships can dodge bombs, for he says, "we are going to get more and more accurate in the matter of dodging them." I would not suggest for a moment that such an officer as Admiral Coontz was trying to deceive the Board. On the contrary, I am convinced that Admiral Coontz himself honestly believed every word he uttered—which leaves me in a condition of amazement that a senior officer of the United States Navy should display such appalling ignorance of his own profession. However, Admiral Coontz can hardly be blamed for holding such views when the Secretary of the Navy himself believes that "zig-zagging if necessary" would be a useful maneuver.

Mr. E. F. Spanner, in *(Continued on page 348)*

AIR—HOT AND OTHERWISE

The Big Show Child's Play

By Frank A. Tichenor

WHEN I attended the Detroit Air Show, it quickly became plain to me that that city's aeronautical group about realizes the maximum of promotional ability as salesmen of aviation to the people of the nation. The ceaseless effort which is being put back of every air activity there shows that the citizens of the world's greatest motorcar manufacturing center intend to make it, as well, not alone America's but the world's greatest aeronautical center.

If any other American town secretly throbs with like ambition let it dampen its hands in the good old way, throw off its coat, and forthwith become intensely occupied. It has its job cut out for it. Some job! My bets are on Detroit against all comers.

The Air Olympics, as pulled off at Detroit, were all that the term implies. Scientifically investigated, as all matters aeronautical should be, they showed by concentrated solution hydrometer test over 100 per cent pure. Not even Ivory Soap claims 100 per cent purity. Detroit claims nothing. It just has it, exhibits it casually, and sets out to get the next better thing without delay.

It was an occasion to make blood tingle. It did in certain instances. I was one of the instances. The start of the Fourth National Air Tour, the Gordon Bennett International Balloon Race and the National Model Airplane Contest all were pulled off in one day—June thirtieth, year of our Lord 1928.

On that day, at that place, the centrifugal force of rapidly moving events concentrated the cream of America's aeronautical effort, plus some of the best from other countries. Perhaps the cream of all this cream may have been found in the National Air Tour start.

But lighter-than-air, also, supplied its absorbing interest. Balloons representing France, Germany, Belgium, Switzerland, Denmark, Argentina and the United States floated like vast bubbles in the atmosphere above that city by the lakes from which continually uprises into the upper levels which they sought the impressive chorus of the most efficient industrial machinery gathered in one spot on earth.

Youth means progression and success. Youth means America and of course, therefore, youth, also, was there, to stimulate the veterans and by them to be stimulated.

The future executives of great American air transport companies and airplane manufacturing plants; the designers whose plans are to make the generation just ahead delight and marvel in the wonders of aeronautics; the engineers who, presently, will have charge of the nation's now undreamed of production of planes in which vast numbers of passengers and incredible weights of freight will be transported, the pilots who will startle the whole world with new speed, altitude and other records—these all were present at Detroit, hidden in a group of youngsters, keenly interested, startlingly intelligent, boys who had been attracted by the model airplane contests.

Years hence what will these bright faced, quick witted, keenly interested, astonishingly well informed, youngsters mean to the United States?

Once more my hat is off to the city which has sprung up at that curious interior location where land and water providentially were so arranged as to make an ideal transport center roughly midway between coal and iron, and thus automatically fitted to become the center of the nation's greatest metal manufacturing industry—that of automotive vehicles and their appurtenances.

As usual Henry Ford and his able son, Edsel, were predominant figures in the events of the occasion.

The night before the day when the National Air Tour started from the Ford Flying Field in its contest for the Edsel Ford Trophy while the International Balloon tests began in another part of the same field, the Fords banqueted in the great Ford hangar over three hundred promising young aeronautical enthusiasts from all parts of the United States, ranging in age from boys of eight to young men of twenty-one. They were to be contestants in the model airplane trials, to be held on this same field the next day.

To call this banquet an inspiring episode hardly expresses it. Try to understand, if you were not present, the effect upon these youngsters of listening to "Bill" MacCracken, "Tom" Lanphier, "Bill" Stout, "Eddie" Rickenbacker, Edsel Ford, 'Bill" Mayo and the others, while sitting at a table spread in the same hangar in which rested for the night those ships from all parts of the United States which the following morning would start in the National Air Tour.

It was a sight fit to give an observer like myself a series of thrills—including one of satisfaction, one of wonder, one of hope, one of confidence and one of patriotic, yip, yip, yip.

Among the youngsters at every table were selected men who could answer any questions that a boy could ask about an airplane or aeronautics. They probably got as much out of the association as the kids did, but they were useful. They were pilots from Selfridge Field, expert in every air sense.

Imagine what their presence meant to all those boys!

That admirable and enterprising publication, *The American Boy*, started the model airplane contests and the aeronautical branch of the Detroit Board of Commerce got right back of it and offered three thousand dollars in cash prizes—just one more of many manifestations of the spirit of Detroiters, always a little more than eager to help anything which has to do with aeronautics.

Ford put the finishing touches on the enterprise, making it the biggest thing of the kind ever occurring anywhere.

I know a man who has made a study of Henry Ford's own boyhood. The help he got was mostly from good-natured workers who had little for themselves and could not do much more than encourage him and teach him what they knew. He had to fight things out almost alone. Most of the boys of his generation did. The impulse had not yet sprung into being which now makes the United States the nation which more than any other strives to help themselves.

I know the story of Henry Ford's first little work shop and its lathe and bench. I know the story of his first mechanical achievement. Not everybody knows about these things. He does. He knows that he succeeded in spite of very difficult obstacles and he believes that, if a little more help from outside had offered, he might, at least, have had a pleasanter time of it.

Naturally no one, not even Mr. Ford, himself, can imagine that a different youth could have made his present triumph greater, for he is the individual most definitely emblematic of success in all *(Continued on page 356)*

A REAL RELIABILITY TOUR

By Ralph W. Cram

"ISN'T this wonderful, dad! I certainly want to learn to fly," said the high school boy who watched us land at San Diego.

"I'm going to be a pilot next year," the taxi driver told me as he carried my bag and portable typewriter out to the plane at Los Angeles.

"Isn't it thrilling!" exclaimed the young ladies who greeted a group of the air tourists at Portland. "I do hope somebody asks me to take a ride."

And so it was all around the 6,300-mile circuit flown by the Fourth National Air Tour. It WAS wonderful; it WAS thrilling, to the thousands and thousands of people who met the 24 airplanes and their 75 passengers in the 32 cities in 15 states which the tour visited this year. And it justified the optimism of the taxi driver who was going to become a pilot, the enterprise of the score of manufacturers who entered planes in the tour, and the visions of that high school boy who saw himself flying, too, when he was out of school and launched upon the new levels of life that are coming with the full development of the flying age.



Route map of the 1928 Air Tour

Looking back on the 6,300 miles traveled by this air armada, one can safely say that it was more significant than any that had preceded it. That 16-year-old high school boy certainly may look forward to the day when such a caravan, the only one in the country and in all history, will be but an incident in the general program of air commerce.

Tour Progress

In several ways the tour conformed with the steady arithmetical progress that commercial aviation is making.

The number of planes entered equalled, and the number of passengers—including pilots and mechanics—exceeded that of any previous year.

The cruise was the longest ever made by any group of planes.

It was the first tour to fly out to and up the length of the Pacific coast.

But most significant of all was the number of new planes that were entered and the new types of motors that were given a grueling test as the tour did the long grind from Detroit to Detroit.

Power Plants

Most important in its bearing on the development of the aircraft industry and the filling of orders for planes from an insistent public that wants to fly, was the showing made by the motor manufacturers who submitted their product to the test of the tour.

There were lots of Whirlwinds, of course—17 of them. There was a Warner, two Fairchild-Caminez, a Velie, a Siemens-Halske, among those that lasted clear around or well to the end of the tour. Benny Howard dropped out in the Wichita-Tulsa stretch when his Menasco-Salmson powered Eaglerock balked. George Peck had trouble with his Siemens-Halske near the Texas-Arizona border, and a glorious reception the Lions club had prepared at his home town of Tucson had to be postponed—the only tragedy on the tour. What technical deductions may be drawn from motor performance we leave to the engineers; but the very fact that new motors in the smaller sizes of the air-cooled division made their bid for popular favor was significant and important.

Only two out of more than two dozen power plants were of the war vintage, water-cooled type—the Hisso in an Eaglerock and the OX5 in the new Curtiss Robin, and the latter plane was so great an advance over the old Jennie as to be able to carry the OX along as a fairly modern combination.

The New Planes

Recalling the former tours, there was much to interest the proponent of commercial aviation as he inspected the ships lined up at any of the tour stops. Improved types there were of various planes that have appeared in former years, and besides there were Bellancas, the Lockheed, the Stearman, the already-mentioned Curtiss Robin, and the two Monocoupes.

It was a real reliability tour. Some days' runs were of more than 500 miles. It made the occasional layovers



Airplanes at Ford Airport ready for the start of the 1928 Air Tour

till the second day welcome for sight-seeing, for resting, and for tuning up the motors. Increasing efficiency of motors and planes was reflected in every additional day on which the ships added to their excellent scores. Only occasionally was a ship delayed here and there to an extent that affected the standing its merit score had given it back in Detroit.

Safe Flying By the Million Miles

Added to the previous three, this fourth tour gave a convincing demonstration of the safety of flying. These lines are written before the cruise is quite finished, but so far no one of the 75 or 80 air tourists has suffered the slightest hurt. That stands for the previous tours also. Taking it for granted that the good record is maintained to the close of this tour, we find:

Total passenger miles flown in four National Air Tours, without injury to a passenger, 2,960,000.

Here are the figures in more detail:

Planes in annual tours: 1925, 17; 1926, 25; 1927, 14; 1928, 24; total 80.

Length of tours in miles: 1,900, 2,600, 4,000, 6,300—total, 14,800.

Average number of passengers each tour, 50. Total for four tours, 200.

Two hundred passengers, 14,800 miles—total passenger miles, 2,960,000.

Imagine an average of 20 automobiles in four races totaling 14,800 miles. You can't imagine them finishing without skidding into ditches, running into trees and telegraph poles, and otherwise damaging themselves and 200 drivers and passengers.

Over Mountains and Deserts

Another argument for air transportation could be found in the fact that the train or automobile distance, over fair to good highways, would be many times that flown by the air tourists. Beneath the planes at times were mountains crossable in no other way. Even good landing places were non-existent. At other times miles and miles of desert stretched in all directions as far as the eye could see, even from the vantage point of the pilot's seat. Mesquite and sand, or rocky and barren mountain, it was all the same to the air travelers of the tour.

They traveled over familiar air tour country as far as Fort Worth, with stops at Indianapolis, St. Louis, Springfield, Wichita and Tulsa. From there the route led west across Texas, over desert and mountain, country which to our inexperienced eyes looked to be worth exactly 0 per acre. We flew over miles and miles of it between San Antonio and Marfa. It was dry and arid and rough, often naked even of mesquite, and cut into deep arroyos apparently by prehistoric rains. It didn't look as if it had rained there for ages.

And yet at Marfa they told us that we were in the cow country, wealthy from its aforetime crop of long-horned cattle and now of shorthorn steers.

Zane Gray Country

As the tourists flew over this cattle country on the way to El Paso, they could see a whole Zane Gray story outlined beneath them.

There were the valleys with the waterholes for control of which the honest young rancher struggled with his designing roughneck neighbor.

There were the canyons where the tough boys hid their rustled cattle, until the hard-riding hero and his enthusiastic helpers traced them out and shot them up and removed them from the map.

Over there is another deep blaze in the mountain where the lovely young lady tenderfoot from the East, come out to claim her rights to the Bar-X, was hidden by her kidnappers until her two-gun lover sought her out and shot his way with her to liberty and the altar.

Air-Minded Texas

Further, incidentally, we found an air-minded lot of folks down there in Texas. At San Antonio they have had no end of military aviation, but are just waking up to the possibilities of commercial aviation. They showed the tourists a 2,400-acre tract, level as a floor, which the city has given the government for the new Air Corps Training Center. Winburn, their municipal field, with its long white runways, was the best-marked field found on the whole tour.

Something one did not expect to find in Texas, but which was there, was a healthy ambition to establish a front-rank aeronautical school. Professors H. J. Ettlinger and H. C. Weaver of the University of Texas came over from Austin to greet the air tourists. They were both prominent in the war-time activities at Austin, when the largest aviation ground school in the world was maintained in connection with the University of Texas. It turned out 6,000 cadets competent to help America help the allies to command of the air—if the war only had lasted a little longer.



Curtiss Robin (Curtiss OX5 engine)



Travel Air (Ryan-Siemens engine)



Eaglerock (Hispano-Suiza engine)



Challenger (Caminez engine)



Lockheed Vega (Whirlwind engine)



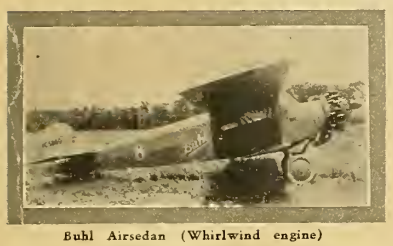
Eaglerock (Menasco engine)



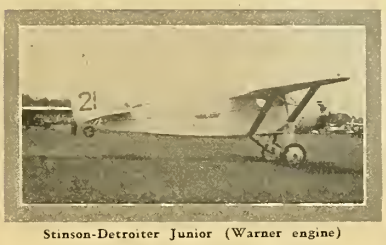
Ford-Stout (3 Whirlwind engines)



Monocoupe (Velie engine)



Buhl Airsedan (Whirlwind engine)



Stinson-Detroiter Junior (Warner engine)



Ryan B1 (Whirlwind engine)

The University of Texas, Dr. Ettlinger told me, now offers a regular four-year course leading to the degree of bachelor of science in aeronautical engineering, and is seeking hopefully for the endowment of a chair in aeronautical design and experimental aerodynamics. Having the scientific and engineering as well as historical background, Drs. Ettlinger and Weaver were looking forward to the time when the Guggenheim Fund, or some other agency, will recognize the claim of their school to do some of the advanced work along this line which it is so hopefully and enthusiastically looking forward to doing.

In Sand-Storm Country

So much for Texas. We left it at El Paso. In Western Texas some of the pilots got into a genuine Texas sandstorm, a mile high and several wide, hard to fly in, above or around. Bad as fog, they said—even worse, for you can leave a fog behind, but you carry a lot of a sandstorm off with you.

Not until they got to Tucson, however, did the air tourists know what a real bad sandstorm is like. Tucson's sandy airport almost blew away in one of those high winds that occasionally lift a part of Arizona into the air and set it down somewhere else.

Pilots hurried out to the field in commandeered cars, fearing their ships had blown over, but found that willing hands had staked and tied them down. One could not see ten feet away, and again the pilots said they had found something worse than fog.

During that dust storm, by the way, Eddie Stinson had them untie his plane and flew it away just to see what a dust storm looked like from the air. Someone opined that one of these days Eddie is going to be bitten by a milk wagon horse and die from the infection. No one has yet suggested anything else that would douse his cheerful humor or divorce his skillful hand from the joystick.

Out Where Lindbergh Started

A hot stop at Yuma, and the air caravan left deserts behind and crossed over the mountains to land at cool and pleasant San Diego. A few hours after landing on Mahoney Field, the tourists were content to believe anything the Southern Californians say about their weather. We had heard of these coast people talking about their weather as unusual; now all they had to do was to insist that it was usual.

We were out where they built the plane that Lindy flew, and where they tell you about the life he led there while the plane was building; his interest in its progress in the daytime; his 30-mile hikes at night to build up his endurance and his ability to do without sleep; his visits there since his flight, and his delight in dropping the rôle of hero and fraternizing with the men, from humblest workman to *Spirit* designer, who helped to make his great feat possible. It is an interesting story, and one that may well be inspiring to that 16-year old boy who hopes to learn to fly.

Where Big Airliners Fly

Los Angeles and San Francisco and Portland and Tacoma were succeeding stops on the way up the coast, with refueling done and lunches consumed at Fresno, Corning and Medford.

On most of the landing fields used by the tour along this stretch of the cruise were landing and taking off the big airliners of the Maddux Air Lines, Western Air Express and Pacific Air Transport, three competing lines equipped with big Fords and Fokkers.

There also the *Standard of California,* the Ford plane that is the pride of the Standard Oil of California Company, joined the tour as supplemental transport, relieving the tour planes of the surplus of passengers and baggage that had overloaded them for some time.

One caught glimpses too of the *Richfield,* the triple-Wasp Fokker operated by the Richfield Oil Company of California, which that company claims is the last word in provision for luxurious air travel. In support of that claim it points to its overstuffed reclining chairs, a full length day bed, writing desk and library, card table, electric refrigerations, thermos installation, a buffet, linen closets, dressing room, and radio transmitting and receiving apparatus.

"A Friend in Need Is a Friend Indeed"

Charlie Meyers, piloting a Waco plane carrying the Crossley radio outfit, was a victim of misfortune and the beneficiary of Texas courtesy, on successive days back in San Antonio. Burning his engine out when almost in sight of Winburn field, his cylinders froze when he was right over Dodd field, near Fort Sam Houston, a few miles from his goal. He alighted on Dodd, which seemed made for the emergency. It cost him some points, but that wasn't the worst. For a time it looked as if he were out of the race, for there wasn't a Whirlwind engine loose within hundreds of miles.

John Frost, a San Antonio *(Continued on page 372)*

the NATIONAL AIR ... UR

By Frank Bogart

Aero Digest Representative on Tour

when planes which
roit on July 28.
hotel room. The
lub. This is my fourth
seen the country clubs of more than
, some of them more than once.)
you are going to get any kind of an orderly,
account of this fourth contest for Edsel Ford's $15,000 beautiful reliability trophy and the appended cash prizes of $15,000, you're going to be wrong by at least four rows of apple trees. I'm going to tell about it any old way that comes, and you can swallow as many valves about it as you care to.

As to assorted statistics concerning this greatest annual event in American commercial aviation, make what you will of the following mélange.

There were 29 entries received by the Detroit Board of Commerce, which sponsors the tour with the joint cooperation of the Department of Commerce and the National Aeronautic Association.

Four of the 29 entries either could not get ready for the start on June 30 or could not satisfy Mr. MacCracken's boys that they were fit to start, so only 25 set out, and all but two of these are here in Tacoma, after nearly 4,000 miles of travel, which speaks for itself. I must remain quite impartial myself. To that end I am traveling aboard one of the Air Corps' cloudbusting Fokker transports, chaperoned by Lieutenant Frank Tyndall of the Langley Field, Va., bombardment group. And I think, by the way, that we correspondents ought to chaperon Frank a little bit hereafter, for he plumb busted the cabin door the other day just by running into it with his head. That's really true, but you can imagine how well that story about bumping into a door is going over at all the banquets when he is being introduced. (I've got one about Billy Brock at a banquet but I must stick to statistics just now.)

The celebrated Mr. E. Stinson of Mule Bend, Miss., San Antonio and Detroit has three of his products in this fleet. The only other manufacturer with three is the boy friend, B. F. Mahoney, with his three Ryan broughams.

And I'll have to take that back right here. There are three Wacos. The little captain, John P. Wood, "Waco from Wausau," is 'way, 'way, 'way out in the lead with his. And the little corporal, Charlie Meyers, is sitting fourth in his. He burned out a motor in San Antonio at the end of the first week, when going nip and tuck for second place with Frank Hawks, the Texaco fogeater, in his Ford trimotor. The third Waco is a member of the valiant rear guard. It is being propelled through the 15 states on our route, and parts of adjoining ones, with appropriate stop overs, by one of the eminent Fairchild Caminez motors, which have just been making their debut out here on the West Coast. Gould Beard is the pilot.

Travel Air had two entries, but there's only one now. George Peck of Tucson, Arizona, was flying one with a Siemens-Halske engine which quit on him just one station from Tucson. He was last heard from struggling up the coast and may rejoin us any time. The other Travel Air is powered by a Caminez, and, so to speak, sired by J. Nelson Kelly, of Virginia, and Chicago, not so far ... a department of commerce inspector at Minneapolis. Mr. Kelly is being a... by Mr. William Stockert, also of Chicago, which is where he has an edge on his partner in the Waco. Beard is going it alone in his plane.

Now when you talk about going it alone in this tour you have to sweep your sombrero to the ground with a low bow to Mrs. Phoebe Fairgrave Omlie of Memphis, Tenn., the first woman ever to pilot a ship in the Ford tour, the only woman pilot in the present event, and the first woman to fly alone across the great American desert. The fact that she tipped over on her first landing in high altitude, at Marfa, Texas, without the least damage to herself, however, is as nothing against the fact that she stepped right into the other Monocoupe in the fleet and went her way. Jack Atkinson of Gary, Ind., the pilot of this ship, remained behind to repair Mrs. Omlie's craft. He rejoined at Frisco. Good sportsmanship on Jack's part as well as the lady's. These little craft, smallest of any in the fleet, are proving up splendidly, as well as doing much to dispel the veiled mistrust of the flivver plane in the past crowded months.

There are two Buhls. Major Louis G. Meister is flying the new special air sedan; Alger Graham has the open cockpit "Airster." There are two Bellancas, one skippered by George Haldeman, the other by Billy Brock. There were two Eaglerocks. One is flown by Cloyd Clevenger. The other, flown by Bennie Howard and Frank Free, had motor trouble and dropped off twixt Wichita and Tulsa. I have spoken of the Ford. Swallow of Wichita is in the race with a ship flown by Melvin Aavang, Elgin, Ill. Dan Robertson is introducing the new Curtiss-Robin with its OX5 motor. Next on the list is Richard W. Pears in the folding wing Fairchild cabin ship. We miss Dick Depew of the two past tours, but Dick Pears is also a fine chap and as sterling a pilot.

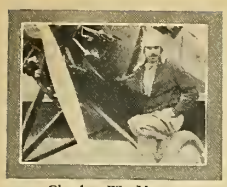
In setting down this list I have omitted to name the pilots of the earlier ships mentioned. Flying the new Stinson Junior is "Randy" Page, without his beard. Bruce Braun of Des Moines has the third Stinson entry. These ships are in third and sixth positions, respectively, with Eddie himself fifth. These are the same positions they held in the relative standings for figures of merit established in the qualifying trials before the ships left Detroit, and in fact, the same applies to nearly all of the first ten leading ships.

The Ryan ships are flown by Vance Breese of San Francisco; E. W. Cleveland of, by and for Cleveland and the Cleveland Pneumatic Tool Company, and Al Henley, who hails from Tulsa but flies out of Fort Worth for the Texas and Pacific Coal and Oil Company, whose plane he has.

And now I'm almost done. There are but two remaining. The Stearman of Wichita, and the Lockheed of Los Angeles. Dave Levy, jockey of the former, has flown every leg of the tour to date with a perfect score. What's more, he only adds up to 22 summers. The youngest of the lot. William P. Innes, Jr., Wichita, is with him.

The Lockheed just misses by a shade being the fastest of the fleet, but it has led the way onto more airports than any other. From Detroit to Los Angeles it was flown by Robert Cantwell, but his wife's illness compelled the substitution of Lee Schoenhair.

To take the planes in their order on the entry list, the first is Brock's and with him is his decoy—No, I have that


Charles W. Meyers


George Haldeman


Ben Howard and Frank Free


McInaney and Clevenger

wrong, of course, it was Bill who was Ed's decoy en route from Detroit to Tokio a year ago. Ed being Edward F. Schlee, who has just formed the Schlee-Brock Aircraft Corporation to distribute Bellanca planes. Their wives have been with them off and on, and are to join up at Spokane to complete the rest of the trip. (They were not in Los Angeles.)


Al Henley


Vance Breese


George Meissner


Melvin Aavang

Also in this plane is James V. Piersol, of the Detroit *News*. I guess the *News* is going to buy a Bellanca or Jimmy would be back with the rest of the help in the Fokker. R. C. McDaniels, Detroit, is the mechanic.

Before I go on I will spring that one on Bill Brock I spoke of up in the preamble. It isn't often Bill can be lured to a banquet table, and once you get him there it is next to impossible to get a word out of him. But he struggled up and screamed this one into the ears of 50,000 persons whose sets were tuned in. Mind you, this is Tacoma, Wash., but Bill, after saying he guessed all the boys were glad to get here, popped this one into the horn:

"This is certainly great country up here and about all I can see that you folks in Oregon need is a California press agent." Praise for *Washington* gone wrong!


Louis G. Meister


John P. Wood


Frank M. Hawks


Schlee and Brock

Mrs. Frank Hawks and Mrs. Bert Hull, both of Houston, are accompanying the former's husband. Also in this ship for a time, until the load had to be lightened, was Mr. Harvey J. Campbell, vice president and executive secretary of the Detroit Board of Commerce. Mr. Campbell can and does make swell speeches daily, starting out with brash reference to the female beauty of the spot wherein he then is and going on to explain that he is just laying the foundation for a good afternoon for himself. Business of falling out of the chairs by members of the audience, even, sometimes, some of the elderly and more determined looking females who have frowned at the little hussies out on the airport, with their propeller-blown skirts. But Mr. Campbell does seem to get that old message across.

Dan Robertson in No. 5 is accompanied by E. C. Doherty, also of St. Louis. The prop of that mild little Curtiss Robin up and nearly broke the arm of said Doherty the other morning at Frisco, but the propeller got the worst of it, I do assure you, for Dan had to get a new one. Dan's Robin is the only OX5 job in the air tour.

With Alger Graham in No. 7 ride Mr. and Mrs. Ray Cooper. Mr. Cooper is the tour manager, Mrs. Cooper the tour managress.

Mr. Cooper has more assistance this year than he had on his first attempt a year ago, and the results are showing. But we are still taking half an hour each, more or less, to check in at the hotels. Mr. Cooper's assistant, Mr. F. T. Shoemaker, is always on hand. He gambols up to the planes with the joyful news that there is a yachting cruise or a barbecue all planned. But anyway, he's having a fine time.

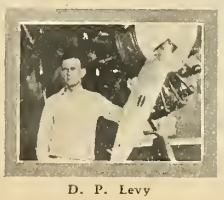
In No. 8, we have Louie Meister and Harry Dunn, his mechanic. No. 9, Cleveland of Cleveland, with these gents—J. F. Wallace, Cleveland, and Norman Siegel, *Cleveland Press*, who lost his hat the first day, then took off his spats before he should lose them as well, and now writes great gobs about the fog banks looking like bowls of whipped cream. There is also in this ship Robert Nesbitt of Chicago, with Reid and Murdoch, Inc., purveyors of the best coffees, etc. These boys have given us all two nifty thermos bottles and keep them filled up with iced coffee (you fairly have to fight to get ice water) at every stop. They have also roped in the Salvation Army lassies to sprinkle doughnuts in our laps.

In No. 10 Henley is accompanied by V. N. Johns, of Houston. The next is Clevenger's. Most of the time he has with him Mrs. C. and all of the time he has with him that jovial Irish brick-layer, I mean salesmanager (but Eaglerock can't turn 'em out fast enough to keep him busy), Mister J. A. McInaney. No. 13 is like 11 and No. 14 I have mentioned. We come then to Vance Breese's Ryan. In it are J. T. Hurst of Los Angeles, head of Mutual Aircraft Corp., Ryan distributors, and Larry Guinther, of Akron, in charge of aircraft tire sales for Goodyear. The Swallow, No. 17, carries C. W. Helm, owner, besides Pilot Aavang. In No. 18 are Wood and his mechanic, Frank Clewers, who sings that Whirlwind Waco to sleep every night. He gave the last pat to Les Maitland's Fokker before

(Cont. on page 370)


Edward Stinson


Robert Cantwell


D. P. Levy


R. Pears and Ray Collins

NATIONAL MODEL CONTESTS

TWO American boys only halfway through their 'teens are now touring Europe to show the boys—and the men—of the British Isles and the Continent the tremendous advances American youth has made in the science of building and flying airplane models. The boys are the winners of the First National Airplane Model League of America contests conducted by *The American Boy* Magazine in Detroit, June 28-30 in connection with the Detroit Air Olympics.

More than 300 boys, representatives of the 175,000 members of the Airplane Model League of America, participated in the contests, held in connection with the Detroit Air Olympics. The contests were divided into three classes—indoor flying, outdoor flying and scale model—with two sections, junior (boys of 15 and younger) and senior, in each class.

To win the William B. Stout Trophy and the indoor championship, Aram Abgarian, 15 years old, had to fly his indoor endurance tractor to a world's record—353.6 seconds.

The boys' outdoor champion is Thomas C. Hill, 17 years old, Winston-Salem, N. C.



T. C. Hill, boys' outdoor model champion

Hill's outdoor twin pusher flew over Selfridge Field for four minutes, ten seconds, on a windy gusty day. This was not a record, but was long enough to win for Hill, in company with Abgarian and Merrill Hamburg, secretary of the A. M. L. A., the special trips to Europe offered by *The American Boy* Magazine.

Though Hill placed first among the boys he is not the national champion in outdoor flying. Joseph J. Lucas, 34 years old, of Chicago, kept his model in the air 14 seconds longer than Hill's, and so won the national Outdoor Trophy. He was not eligible for the trip to Europe, however.



Aram Abgarian wins the Stout Trophy

William Lofton Dennis, 17 years old, Miami, Florida, took first place in the scale model contest. His 24-inch replica of a Curtiss Army Hawk earned a rating of 97 per cent on the judges' sheets. He won a trip to Los Angeles as the guest of the AERO DIGEST to attend the National Air Races next month. There were 232 scale models entered in this contest.

The two boys who won the trip to Europe will give public exhibitions at the famous Wimbledon Stadium near London under the auspices of the Society of Model Aeronautical Engineers of England, and in Paris will be the guests of Marshal Hubert Lyautey, conqueror of Morocco. They will go on to Geneva to fly before dignitaries of the League of Nations, and will also visit Camp Vaumarcus, Lake Neufchatel, Switzerland, where they will meet boy representatives of twenty nations at the world-wide Y. M. C. A. camp.

The contests wound up the first year's work of the Airplane Model League of America, organized in 1927 by the *The American Boy* to foster interest in and knowledge of aviation. In its campaign to make American youth air-minded, the League enrolled 175,000 members, answering 350,000 letters—most of them with technical aeronautical question, supplied to boy model builders, at cost, 125,000 kits for construction of scientific miniature planes, issued several hundred honor certificates for meritorious work, prepared a special airpline model motion picture, enlisted the aid of 54 leading American newspapers and sent "flying squadrons" of expert builders and flyers to various cities throughout the East.

Special features of the contests program were a banquet at the Ford Airport hangar, with Edsel B. Ford, president of the Ford Motor Company, as host and William P. MacCracken, Jr., assistant secretary of commerce for aeronautics, as chief speaker; the scale model contest at Convention Hall, the indoor contest at Olympia auditorium and the outdoor contest at Selfridge Field; attendance at the Air Olympics at Ford Airport, where the National Air Tour and the Gordon Bennett International Balloon Race started; and the closing banquet at the Hotel Statler, contest headquarters.

The complete list of prize winners follows:

Stout Indoor—Class A

Albert Mott, Detroit, 341 seconds; Ernest McCoy, Detroit, 331; Jack Loughner, Detroit, 315; George Novak, Detroit, 269; George Emmett, Fall River, Mass., 250; Thomas Condax, Philadelphia, 231; Jack MacLellan, Wyandotte, Mich., 228; Nick Vitale, Detroit, 227.

Bronze Medal Winners: William Atwood, Riverside, Cal.; Harry Cone, Elmira, N. Y.; Hale Carpenter, Philadelphia; Vernon Conzett, Detroit; Joseph S. Culver, San Francisco, Calif.; Charles Dybvig, Detroit; Paul Meyers, Cleveland; Richard Salathiel Inde-



W. Dennis, Aero Digest prize winner

pendence, Kansas; Irving Johnson, Chicago; Lawrence Hankammer, Des Moines, Ia.; Neil Severns, Columbus, O.; Douglas Walter, Wyandotte, Mich.; Bronson R. Myers, Chicago; Stanley Smith, Rochester, N. Y.; Kenneth A. Willard, Evanston, Ill.; Charles Van Horn, Philadelphia, Pa.; Herbert G. Dorsey, Washington, D. C.; Bernard Schwartz, Chicago; Glenn Reichman, Buffalo, N. Y.; Myron Stepath, Springfield, Mass.; Robert Hayes, Detroit; Donald Lockwood, Chicago, Ill.; Thomas Willis, Chicago; Andrew Freeland, Philadelphia, Pa.; John W. Cooper, Albany, N. Y.; Arthur O. Heinrich, Baldwin, L. I.



Prize winning scale models—left: Ford (G. Thompson, Jr.). Center: Curtiss (W. Dennis). Right: Ryan (J. L. Parker)

Stout Indoor—Class B

Aram Abgarian, Detroit, 353 seconds; Gordon Johnstone, Detroit, 280; Carleton Roushkolb, Detroit, 270; Milton Wollman, Philadelphia, 258; Neville H. Geake, Detroit, 248; Archie Schroeder, Wyandotte, Mich., 237; William Chaffee, Detroit, 228; Casimir Leja, Chicago, 227.

Bronze Medal Winners: Francis Klute, Detroit; Edward Petruska, Cleveland; Byron Jilek, Cleveland; John Dawson, Evanston, Ill.; Lawrence J. Sim, Wyandotte, Mich.; Alfred M. Davock, Detroit; Cloyd Smith, South Bend, Ind.; Leonard Popham, Port Huron, Mich.; George T. Bell, Washington, D.C.; Raymond Mitchell, Fall River, Mass.; Walter Anthony, Cleveland; Richard Abbey, Oakland, Calif.; Cecil Hills, Dearborn, Mich.; Jack Kistler, Detroit; Marsden Gribbell, Deshler, O.; Robert E. Atwater, Elmira, N. Y.; Sterling Wardwell, Watertown, N. Y.; Albert Schwarzkopf, Norfolk, Va.; Edward Harms, Evanston, Ill.; Maurice Gillighen, Detroit; Carl V. Carlson, Chicago; Katsuro Miho, Hawaii; Richard K. West, Evanston, Ill.; Alex Riscky, Fort Worth, Tex.; Joseph H. Ehrhardt, St. Louis.

Winners in Senior Division

National Outdoor Division

Joseph J. Lucas, Chicago, Ill., 264 Seconds; Thomas C. Hill, Winston-Salem, N. C., 250 Seconds; Thomas Condax, Philadelphia, Pa., 249.4 Seconds; Henry E. Goebel, Rochester, N. Y., 240 Seconds; Robert E. Hayes, Detroit, Mich., 234 Seconds; Lloyd Fish, Washington, D. C., 217 Seconds; Joseph Culver, San Francisco, Cal., 207.6 Seconds; Ford Grant, Detroit, 207 seconds; Don Gardner, Detroit, 184 Seconds.

Bronze Medal Winners: Paul H. Coleman, Columbus, Ohio; Paul A. Mayer, Cleveland; Edward Miller, Jr., Chicago; John Redmond, Champaign, Ill.; Herbert Fish, Cleveland; Irving Johnson, Chicago; Albert W. Mott, Detroit; Virgil Rassner, Peru, Ind.; Daniel Ludlow, Champaign, Ill.; Jack Loughner, Detroit; Charles Miller, Cleveland; F. L. Jenkeh, Gagetown, Mich.; Donald Lockwood, Chicago; W. A. Johnson, Chicago; John Markley, Bartlesville, Okla.; B. R. Meyers, Chicago; Bertram Pond, Peru, Ind.; Bernard Schwartz, Chicago; Wendall Bailey, Oklahoma City, Okla.; Harry W. Cone, Elmira, N. Y.; Fred L. Johnson, Birmingham, Mich.; Howard C. Smith, Kenosha, Wis.; Fred M. Johnson, Hawthorne, N. J.; Henry E. Fayville, Madison, Wis.; Walter Samsoe, Kenosha, Wis.; John T. Bird, Detroit.

Winners in Junior Division

National Outdoor Contest

Carl V. Carlson, Chicago, Ill., 175; Edward Petruska, Cleveland, O., 169.4; Sartor E. Stewart, Louisville, Ky., 160; Aram Abgarian, Detroit, 160; Casimir Leja, Chicago, 149; H. J. Dorsey, Washington, D. C., 139; Robert E. Atwater, Elmira, N. Y., 132; William Chaffee, Detroit, 129.4.

Bronze Medal Winners: Katsuro Miho, Kahului, Hawaii; Francis Klute, Detroit; Lawrence Sim, Wyandotte, Mich.; Arthur Liephart, Cleveland; Fay Stroud, Detroit; Irving Ranka, Wyandotte, Mich.; Evan Sharpe, Springfield, Ohio; Wallace Johnson, Fort Dodge, Wisc.; Kenneth Belliveau, Springfield, Mass.; John Dawson, Evanston, Ill.; Allen Donovan, Syracuse, N. Y.; John Sigford, Minneapolis, Minn.; Jack Laister, Wyandotte, Mich.; Edward Harms, Evanston, Ill.; Robert MacLaren, Detroit; Fred Schelter, Detroit; Joseph H. Ehrhardt, St. Louis, Mo.; Charles Mayer, Bridgeville, Pa.; Harvey Gunning, Gulfport, Miss.; Gordon Gilbert, Detroit; Jack Kistler, Detroit; Willis Kullman, Cleveland; Sam Taylor, Ypsilanti, Mich.; John G. Young, Lansing, Mich.; Frederick Bonadio, Watertown, N. Y.

Scale Model Contest Winners—Class A

(There were 128 models entered in the Class A contest)

1—William L. Dennis, Miami, Fla.; 2—Tudor Morris, Peru, Indiana; 3—Cyprien Porrier, Chicopee Falls, Mass.; 4—Leon M. Gregg, Westbrook, Conn.; 5—Seymour Dunham, Dayton, Ohio; 6—Joseph Sevilla, Springfield, Mass.; 7—Paul A. Meyer, Cleveland, Ohio; 8—Floyd Kowalak, Buffalo, N. Y.

Bronze Medal Winners: Charles N. Black, Columbus, Ohio; Leonard W. Ross, Du Quoin, Ill.; William White, Martinsburg, W. Va.; Clayton H. Tanner, Urbana, Ill.; George F. Schultz, Buffalo, N. Y.; Harvard C. Smith, Kenosha, Wis.; Homer H. Jones, Cincinnati, Ohio; William T. Howell, Detroit, Mich.; Norman E. Zapf, Rocky River, Ohio; James Cook, Aspinwall, Pa.; Daryl Lightbody, Oakland, Calif.; James W. Ashbaugh, Cortez, Col.; Ernest W. Fuller, Atlanta, Ga.; Hubert Harden, Verdon, Nebr.; Clarence A. Sharp, Kansas City, Mo.; Harry L. Kitselman, Hollywood, Calif.; Samuel Hays, Jr., Erwin, Tenn.; Virgil De Claire, Detroit, Mich.; Oliver McCahon, Lorain, Ohio; Karel Valasek, Chicago, Ill.; Wilbur G. Bodell, Battle Creek, Mich.; Norman E. Ort, Wainfleet, Ontario; Robert W. McKee, Zanesville, Ohio; Daniel A. Ludlow, Champaign, Ill.; Roger Copley, Hazel Park, Mich.

Scale Model Contest Winners—Class B

(There were 104 models entered in the Class B contest)

1—George Thompson, Jr., Winner, S. Dakota; 2—James L. Parker, Salisbury, N. C.; 3—Merl C. Jenkins, Ithaca, N. Y.; 4—Joseph Garside, Milton, Mass.; 5—Wallace J. S. Johnson, Fort Dodge, Ia.; 6—Lewis Carlson, Naugatuck, Conn.; 7—Ray A. Shepherd, Hilo, Hawaii; 8—Richard White, Kansas City, Mo.

Bronze Medal Winners: Charles F. Marschner, Highspire, Penn.; Grover Davidson, Chews P. O., N. Y.; James Coyle, Philadelphia, Pa.; Martin Strand, Dearborn, Mich.; Richard Caldwell, Detroit, Mich.; Robert Beebe, Oak Park, Ill.; Esther Benfer, Metamora, Ohio; Arthur Van Laken, Detroit, Mich.; Louis F. Mahan, Iowa City, Ia.; Lawrence McClellan, Fletcher, N. C.; Frank Urso, Detroit, Mich.; William Thaler, Detroit, Mich.; Maurice Cooper, Little Rock, Ark.; Lawrence Shields, Barre, Vt.; Robert Kavanaugh, Rochester, N. Y.; Kenneth Mudie, Detroit, Mich.; Earl Peterson, Jackson, Mich.; James R. W. Bent, Wilkinsburg, Pa.; Ralph Mattoon, Little Falls, N. Y.; Byron Creel, Louisville, Ky.; Donald Hehman, St. Bernice, Ind.; Benton H. Moorhouse, Highland Park, Mich.; Lawrence Valentine, Cumberland, Md.; Frederic C. Sparrow, Jr., New London, Conn.; Emery Lindbergh, Oakland, Calif.



"American Boy" Banquet at the Hotel Statler, Detroit, for the boys competing in the National Model Contests.

ARMY WINS GORDON BENNETT BALLOON RACE

THE United States Army balloon, piloted by Captain William E. Kepner and Lieutenant William O. Eareckson, won the Gordon Bennett international balloon race which started from the Ford airport at Detroit on June 30. The total distance traveled by the Army balloon was 460.9 miles, from Detroit to a point three miles southeast of Kenbridge, Va. Kepner and Eareckson landed with all ballast gone.

The German balloon *Barmen*, piloted by Hugo Kaulen with his son, Hugo Kaulen, Jr., as aide, established a distance 1½ miles short of the Army's balloon. The *Barmen's* distance was 459.4 miles, the landing having been made three miles south of Chase City, Va.

The French bag *Blanchard*, piloted by Charles Dollfus with Georges Cormier as aide, landed four miles northeast of Walnut Cove, N. C., on the bank of the Dan River —a distance of 447.9 miles.

Distances and landing places of the nine other contestants are given in the accompanying list. Distances were computed by Dr. George Otis Smith, director of the Geological Survey, and George O. Hawkins, director of the computing section of the Survey.

The victory of the Army team gives the United States permanent possession of the Gordon Bennett trophy, which is the second in the competition. The first was won by Belgium's famous balloonist, Ernest Demuyter, and the Belgian Aero Club established the second trophy. Now the National Aeronautic Association will undertake the establishment of the third trophy to perpetuate the memory of James Gordon Bennett and the sporting and scientific contest he inaugurated. The Bennett trophies have been in international competition annually since 1906, except during the war.

Captain Kepner was born in Peru, Ind., in 1893 and served as an officer in the Indiana National Guard until the outbreak of the World war. He served as captain in the infantry in 1917 and won the D. S. C. for distinguished service. In 1921, he entered the Air Corps lighter-than-air branch and was rated an airship pilot in 1922. He took a course in airship training at the naval airship station, Lakehurst, and completed 340 hours of flying training in this type craft. He and Lieut. Eareckson won the national contest this year, which started from Pittsburgh on Memorial day. Capt. Kepner now is assistant commandant of the Air Corps Balloon and Airship School at Scott Field, Belleville, Ill.

Lieut. Eareckson, born in Maryland, May 30, 1900, entered West Point from the enlisted ranks of the Army and was graduated in June, 1924. He entered the Air Corps, completed the course of primary airplane training in Texas and transferred to the lighter-than-air branch, receiving his airship pilot and balloon observer ratings in June, 1926. He has served as Capt. Kepner's aide whenever that officer made any extended balloon flights. He is now on duty a Scott Field.



P. & A. photo.

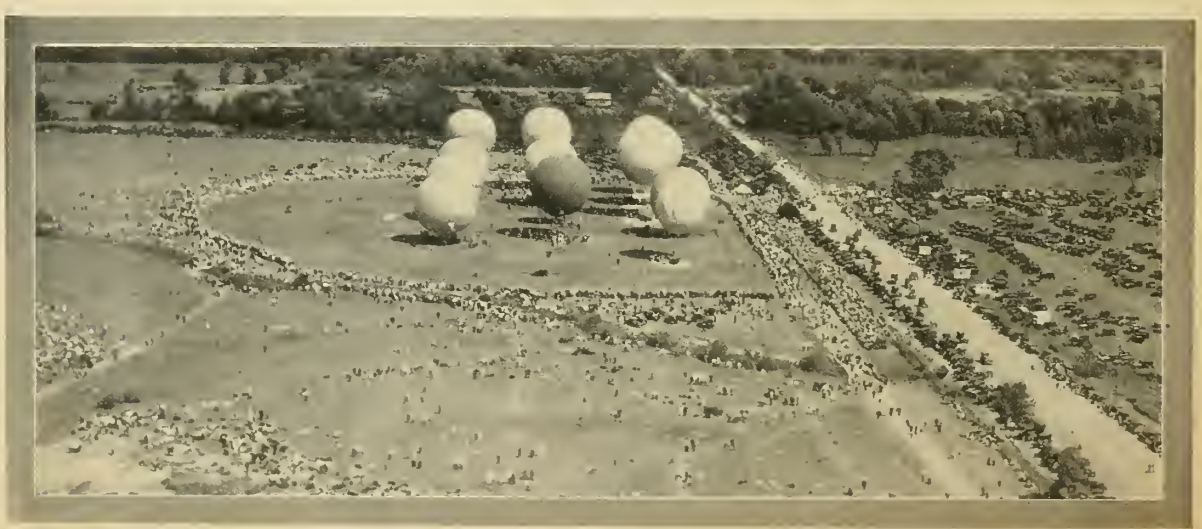
The winning U. S. Army balloon with Capt. Kepner, pilot, and Lt. Eareckson.

GORDON BENNETT BALLOON RACE RESULTS

FORD AIRPORT, DETROIT, MICHIGAN, JUNE 30, 1928

Place	Balloon	Country	Pilot & Aide	Landing Place	Distance (Kilometers)	Distance (Miles)
1.	U. S. Army	U. S.	Capt. W. E. Kepner Wm. O. Eareckson	3 mi. S.E. Kenbridge, Va., Lunenburg County	741.7	460.9
2.	Barmen	Germany	Hugo Kaulen, Sr. Hugo Kaulen, Jr.	3 mi. S. Chase City, Va., Mecklenberg County	739.3	459.4
3.	Blanchard	France	Charles Dollfus Georges Cormier	4 mi. N.E. Walnut Cove, N. C., Bank of Dan River	720.8	447.9
4.	Lafayette	France	Georges Blanchet Dr. G. A. LeGallee	1½ mi. S. Fife, 1 mi. N.E. Bula, Goochland County	669.	416.
5.	Denmark	Denmark	S. A. U. Rasmussen T. W. Southworth	2 mi. N.E. Roanoke, Va., Roanoke County	624.4	388.
6.	Munster	Germany	F. Eimermacher Carl Zech	Big Island, Va., Bedford County	622.8	387.
7.	American Business Club	U. S.	C. A. Palmer Lt. F. M. McKee	2 mi. S. of W. Lipscombe, Va., Augusta County	594.	369.
8.	Argentine	Argentine	Edward Bradley H. H. Elliff	Between Millboro & Millboro Springs, Bath County, Va.	568.	353.
9.	Detroit	U. S.	W. C. Naylor Russell Wherritt	35 mi. N.E. Marlinton, W. Va., Pocahontas County	523.	325.
10.	Wallonie	Belgium	Lt. Jos. Thonnard Maurice Boel	Beverly, W. Va., Randolph County	478.	297.
11.	Brandenburg	Germany	Otto Bertram Geo. Froebel	Davis, W. Va.	474.	295.
12.	Helvetia	Switzerland	E. L. Maag	3 mi. S. Worthington, W. Va.	404.	251.

Distances scaled by U. S. Geological Survey from information as to point of landing furnished in the log of flight by each contestant. For balloons U. S. Army, Barmen and Blanchard, distances were also computed.



Kalec and Forster.

The start of the 1928 Gordon Bennett Balloon race at Ford Airport, Detroit, Mich.

COMPARATIVE EXAMINATION OF AIRPLANE AND AIRSHIP

By Carl B. Fritsche, *Vice-Pres. Aircraft Development Corp.*

Abstract of a paper read before the American Society of Mechanical Engineers, Detroit, June 29, 1928

RECENT transatlantic flights have served to mask the inherent limits of commercial range of the airplane, with the result that the superior qualifications of the rigid airship for long distance heavy cargo service have apparently been overlooked.

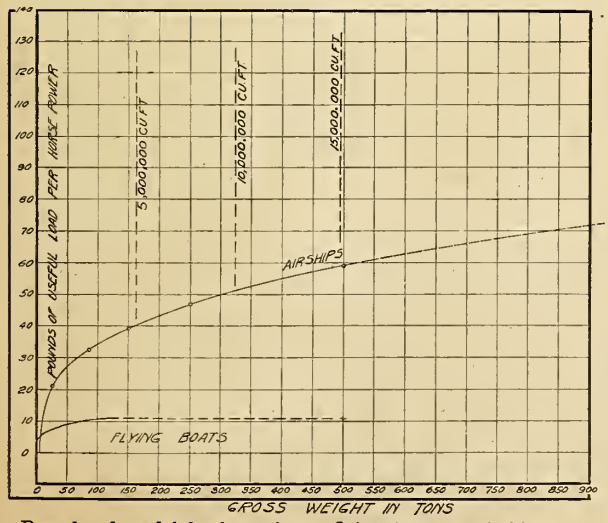
The commercial common factor of aircraft is best expressed in the weight of commercial load transported over a given range.

Eminent authorities agree that not only does the airplane fail to increase in efficiency with the size in this respect, but that in the extremely larger sizes, the airplane actually shows decrease in efficiency. Some authorities conservatively establish the maximum efficient size of the airplane at 50,000 lbs. gross weight and its useful load at 11 lbs. per h.p.

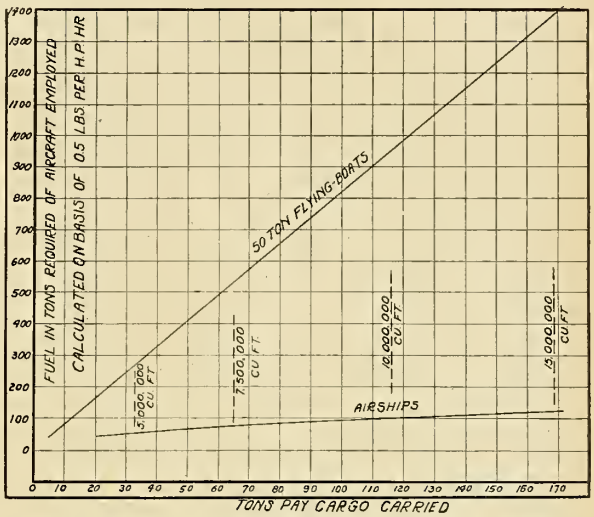
Certain European engineers voice the opinion that the maximum efficient size of the flying boat exceeds that of the airplane, possibly by a ratio of two to one. Probably this is due in part to the absence of the enormous parasite drag from multiple landing gear with wheels about six feet in diameter which would be required on an airplane of 50,000 lbs. gross weight. Furthermore, a higher landing speed can be tolerated in flying boats than in airplanes because boats in maneuvering are not restricted to the narrow confines of landing fields; they can utilize more distance; and the impact at landing on water is more evenly distributed throughout the structure than is true of the airplane on land. This advantage is one which permits a high wing load factor for the large flying boat.

Inasmuch as it is axiomatic in transportation experience that any vehicle must be able to support itself in the medium in which it floats, the large flying boat obviously is preferable to the airplane in application to long distance overseas flying.

However, inasmuch as the utilization of an excessive proportion of useful load for fuel purposes decreases the carrying capacity left available for pay cargo, the operation of large flying boats in non-stop service across the Atlantic Ocean is financially impracticable.



Pounds of useful load per h. p., flying boat vs. airship in a flight from New York to London.



Fuel in relation to pay cargo for flying boat and airship.
Airship—3200 miles (New York to London) Cruising speed 75 m.p.h.
Flying boat—4400 miles (New York via Bermuda and Azores to Southampton) Cruising speed 115 m.p.h.

The rigid airship, in contrast to the airplane and flying boat, increases in efficiency with size. Three examples are given:

NEW YORK TO LONDON NON-STOP AIRSHIP SERVICE—3,200 MILES (Helium Inflated)

Gross weight of airship..	150 tons	250 tons	500 tons
Useful load	78 tons	140 tons	295 tons
Useful load per h.p.....	39 lbs.	47 lbs.	59 lbs.
Pay cargo	28 tons	65 tons	170 tons
Percentage of gross lift available for pay cargo..	19%	26%	34%

And these airships are not miracles. From an engineering standpoint there is absolutely no mystery about man's ability to build them successfully. The proven materials are available. The practical methods of bonding these materials together are well known. The skilled labor can be secured. In fact the two airships now being built in England are about equivalent to the first size illustrated, and the 250-ton ship follows in natural sequence.

The 250-ton rigid airship, whose performance is described above, would be equipped with an engine capacity of 6,000 h.p. and would transport 65-tons of pay cargo on a 3,200-mile non-stop flight from New York to London.

It would require thirteen flying boats of 50 tons gross weight each, and having a total rated h.p. of 78,000, flying 4,400 miles via Bermuda and the Azores (in order to refuel) to equal this performance.

A survey reveals that 158 units represents the world's effort to date in rigid airship construction. Semi-rigids constructed in Italy, France and elsewhere are not included because their inherent limits in size and strength eliminate

(Continued on page 368)

AERO DIGEST

Published Monthly
THE AERONAUTICAL DIGEST PUBLISHING CORPORATION
220 WEST 42nd STREET
NEW YORK

Vol. 13 AUGUST, 1928 No. 2

CARRANZA

THE death of young Carranza was particularly tragic, but perhaps served a definite purpose in advertising to the world, even more elaborately than his flight had done, the fact that in our Southern neighbor, Mexico, which usually gets into the news with revolutions and assassinations, there also is a fine and splendid undercurrent of real, progressive and splendidly ambitious thought.

Some day, when Mexico has cast aside its thralldom to its politicians (or has developed politicians of a new and better sort) she will produce, I think, rather more than her numerical proportion of able and ambitious youth, in many and perhaps most lines. Carranza was a wonderful lad. He showed what flying material exists in Mexico.

The Panama Canal is barely South of Mexico. We should establish such aeronautical relationships with this inconceivably rich and potentially progressive country as will assure us that its splendid youth never shall be trained to work or fight against us.

In every true sense of the word Carranza was a Good-Will Flier. He felt, stimulated and left good-will behind him. No more efficient means of creating it exists than aeronautics.

THE N. A. A. AGAIN

ABOUT a million people in the United States are ready to join a real, honest-to-Agnes civilian aeronautical association that will be truly representative of the ideals of the flying man, whether of the Army, of the Navy, of the Air Mail or of the growingly vast number of individuals now interested in commercial aviation. At least 1,000 flying clubs, some good, some not-so-good and some no good, were formed in America during the year, designed either worthily to stimulate, or unworthily to capitalize, the enthusiasm of American youth for aeronautics. That many have found that the creation of fake or useless organizations offers an easy way to make a living is the reason why we are saving in this office, with the probably vain hope of using it again, the rope with which some Texan friends once lynched a horse-thief.

The only substitute we have for that which we so badly need is the National Aeronautic Association.

It is a mere tin can tied to the kite-tail of America's flying impulse. During the year it has added a few new chapters, mostly, through mistaken calculation on the part of joiners; but what a real opportunity it has missed!

Will it continue to wobble painfully, just keeping out of nose-dives, during 1929? New officers will be elected in September. If it preserves its old idea that it should elect a president because, for personal reasons, he may be willing to make up its annual deficit in order to secure the doubtful "honor," it will remain rather worse than useless.

It cost Howard Coffin plenty for a couple of years. Then Godfrey Cabot became its little bank around the corner, while a sacred codfish smiled applause. It cost Frederick B. Patterson a pretty penny. During the recent pair of twelve mnths Porter Adams has had the privilege of loosening up.

What a crying shame! The one real need of American aeronautics during all this time has been of a tense, enthusiastic, intelligent organization to battle, down in Washington, for all the air services and for commercial aviation, and in every state of the union in behalf of proper aeronautical legislation and all other right promotion of flying in this country.

By merely carefully coördinating the now existing flying clubs, associations or whatever, into a strong national body similar to the American Automobile Association, an important membership could be achieved and a real power created.

To accomplish this—hire good men and pay them to do the job and if they don't do it, fire them. Make the dues one dollar a year. Encourage the kids to join: over one hundred and fifty thousand youngsters in less than a year joined the model airplane contest conducted by *The American Boy*.

Run the N. A. A. as you would your own business—it is just as important to the future of your country. Make the slogan "A Million Members in 1929" and get them.

No reason exists why the National Aeronautic Association should be the step-child of some tuft-hunting rich man. It can and will support itself and when it does it won't let years go by without worth while accomplishment, as all its recent years have been.

And remember that if you elect a president just to pay the bills you must accept the administration he gives, be it good or bad. You can't fire the one who pays the bills. So if another year is wasted—members blame yourselves.

THE CANAL'S SAFETY

WE are glad the Kellogg Treaties have been so successfully negotiated with the leading countries of the world. We are sorry that during the same month in which this constructive enterprise came to its fine fruition the Government of Panama granted to a German Colombian company an air base at Porto Bello, which is ticklishly near our Panama Canal.

It is not to be forgotten that we wished recently to make with this Southern neighbor a treaty of a sort which would have forbidden such procedure, but that Panama refused to join in that kind of a pact with us.

Theodore Roosevelt started the Canal when he had neither the authority nor the money with which to do it. He regarded it as necessary to keep out dangerous foreign influences—and that was foresight.

We wonder what he now would say, snappily, his white teeth gleaming and his tense lips fiercely spread, if he were here with us to comment on this privilege accorded by Panama to the expert and highly organized aviation project of a European nation with which we recently were bitterly at war.

The base which Panama has granted is only a few miles from our Canal entrance.

The ostensible reason for granting it is that this German company has been contracted with to make air-photographic surveys of the boundary between Colombia and Panama.

In making such photographic air surveys so close to the canal it will be utterly impossible, no matter how minutely the expert Germans try to avoid an act which naturally must be displeasing to those among us who have Rooseveltian ideas, to avoid making, also, a photographic air survey of the Canal, itself.

This company, known as Scadta, and entirely German in fact although this is not admitted, now has definite contractual air control in those two republics to the South of us.

We should strengthen our coastal defense at that point without delay—we may need it.

THE FLIGHT FROM ITALY TO BRAZIL

Ferrarin and del Prete break world's distance record

AT 6:51 o'clock on the evening of July 3, their take off watched by only a small crowd of Italian Government officials, Captain Arturo Ferrarin and Major Carlo P. del Prete climbed into the air from the Montecello air-drome near Rome. Ahead of them was a flight across the Mediterranean, a good sizable chunk of Africa and the Atlantic Ocean to a new world's distance record.



The Savoia-Marchetti with 550 h.p. Fiat engine

Their plane was a special Savoia-Marchetti, the closest approach to the flying wing, the dream of designers since the early days of flying. A complete description of the plane and motor will be found on another page of this issue of AERO DIGEST. It is enough to say here that this plane has no fuselage in the ordinary sense of the word, merely an empennage with the tail surfaces so close to the broad thick wing as to cause conservative designers to deliver themselves of skeptical comments when the ship was first projected.

Alessandro Marchetti, it might be mentioned here, is working on a definite design for a monoplane along the same general lines of the transatlantic plane with a wing spread of 350 feet. Little is known about this new plane here. A report from an authoritative source, however, has been received by AERO DIGEST to the effect that the new giant ship will be ready to fly early next year.

Mounted atop the wing is the 550 horsepower water-cooled V type Fiat engine in an efficiently streamlined nacelle driving a pusher propeller. In twenty-six duralumin tanks in the wing were between 850 and 900 gallons of fuel—the exact amount carried has never been made public—and there were 60 gallons of oil.



Map of the Italy-Brazil non-stop flight

A special runway a mile in length had been constructed for the take-off and it was none too long. The plane according to reports took the air at the very end of the runway, climbed slowly and pointed out to sea, the course laid for Gibraltar. A few minutes after leaving Italy the fliers sighted the shore of Sardinia. Next they picked up the light houses of Cape Ferdandino and Cavoli Island. They were flying then at about 1,000 feet. Across the Mediterranean they continued to climb slowly and when they sighted the African Coast near Algiers they had about 1,200, and at this point they ran into their first trouble.

The temperature of the air even at their altitude suddenly rose to 95 degrees Fahrenheit. Their water temperature climbed quickly to 197 and the oil moved up to 87. They veered to the northward, away from the African coast to seek lower temperatures, losing a little of the precious mileage.

Early in the morning as they neared Cape Gata they met low fog over which they flew as far as Gibraltar. Here they were sighted from the ground although they did not know it at the time. They passed over the Straits at 5:15 a. m. flying very fast according to observers.

A few minutes before they were sighted according to their own report to the Italian Air Ministry they saw sticking up through low clouds Almira Point. Here they ran into a local storm and the air for a time was exceedingly bumpy. They were flying fast—about 130 miles an hour—and they quickly flew out of the active storm area into smoother going, climbing to about 3,000 feet. They flew down the coast of Africa at this altitude without seeing it because of continuous clouds and fog.

Shortly after noon the weather cleared and they went down between clouds to have a look at the coast. They found themselves near Cape Jubi. Along the coastline they flew until they reached and recognized Villa Cisneros which they reached at 2:50 p. m. Their original plan had been to proceed further down the coast but the weather and wind being favorable they took a bearing off Cape San Rocco and put out to sea. They were last sighted over the mainland at Villa Cisneros and were reported by a steamer near the Cape Verde Islands, 22 hours out from Rome. So far the flight had been extremely fast, an average of 136 miles an hour.

Fifty minutes after leaving the coast of Africa the Savoia-Marchetti nosed into thick clouds again and they climbed slowly, flying blind, hoping to get out. At 11,000 feet they were still in the clouds and they stayed there during much of the night with now and then a break which gave them a look at the stars. From 11 until 2 in the morning they flew blind without a break.

Near the equator the sky appeared again but fog lay on the surface of the ocean. As they approached the South American Coast they took repeated bearings from the stars and were able as dawn approached to authenticate their astronomy and locate themselves with a reasonable degree of accuracy. At this point, still some hundreds of miles off the coast they encountered head winds straight out of the southeast which drove them a little to the east of their course, and this continued until they sighted land.

(Continued on page 366)



Associated Press photo.

Maj. Carlo P. del Prete and Capt. Arturo Ferrarin after their distance record breaking flight from Italy to Brazil.

PERSONAIRLITIES

By, by Caldwell

WELL, folks, we'll start off this month with what probably is the world's worst biography. I know it ought to be, for I wrote it myself under the worst biographical conditions possible. If any of it is true, I'm surprised and delighted—and if it isn't, I don't really care much. The subject, or victim, of this biography is one George Haldeman, the answer to the maiden's prayer. I first find mention of him in the Bible, in the first chapter and sixteenth verse of the Book of Ruth: "And Ruth said, 'Intreat me not to leave thee, or return from following after thee: for whither thou goest, I will go; and where thou lodgest, I will lodge; and where thou sinketh into the Atlantic, there also will I sink—or sank.'"

But skipping Bruno and Blythely the intervening years and getting down to George's present reincarnation, the entranced reader learns that George and I were doing a bit of elbow exercise in George's apartment at the Warwick (pronounced Warrick by the better element among us). After exercising the biceps for an hour or so we dined at the Quiet Birdmen, after which we spent a pleasant hour in the homelike atmosphere of Major M. K. Lee's apartment, where Duke Schiller had apparently been doing his glass-work for that night. Duke told us all about how he had flown the serum to Greenley Island, which got us so worked up that George and I dashed out into the night and collected Ed Cornell and Billy Brock, the fatter and funnier of those two Siamese twins, Brock and Schlee. The excited reader recognizes at once that we have here the fundamental elements of a large, wide night. Well, we won't bring that up, except to hint that the quietest party at the Frivolity Night Club was not ours. Not after 4 a. m., anyhow. At about 5 we left—or were thrown out—or they closed the joint (I'm a trifle hazy about the move). But, anyhow, we seemed to find ourselves back in the Warwick, or Warruk, or Whatnot— all seated there with the usual perspiring glass. I think Billy Brock was still with us. Yes, I recall he was there. And if my memory fails me not, Ed Cornell was swaying around somewhere. And there were at least two of the blondes that gentlemen prefer—though personally I prefer bonds. But there was quite a party. And in the midst of all the uproar it occurred to me to say, in a loud, vibrating tone of voice, "George, I've never put your biography in my PersonAIRlities department. Let's have it."

Staggered at this kind attention from a great historian, George threw himself—or fell—into a chair and started to tell me all about himself, while I seized a pen and took notes. That is, I thought they were notes. But now that I go over them in the sweet seclusion of my abode on the Hudson, I don't know what to call them. Notes they may be; but legible they are not. I find the word, "Born—" and a blank. Whether that blank was left to fill in with a date, or whether it meant that George was born blank, I don't really know—and there's no use guessing about an important matter like that, so we'll just leave it, "Born blank." I should say here that all the time George was telling me this history the other members of the party were laughing heartily. I recall roaring with laughter myself, at all the witty things George said—though now I come to look for them in my notes, I can't find a single funny remark. I mean, I wrote them down, but they aren't funny now. And they were absolutely excruciatingly funny when I wrote them down. However, such as they are, here they are—those I can read:

George Haldeman first saw an airplane in 1911—and walked right on by. But on July 28, 1917, after his country had been bawling its head off for recruits since the previous April, George put in an application for the Air Service and finally reported to Billy Brock and his—I've written "quahogs" but I think I meant cohorts—at Park Field, Memphis, Tennessee. Oh, before that at School of Military Aeronautics, Austin, Texas. Then he went to Wilbur Wright Field where he took a gunnery course and was half shot all the time until he passed out. On August 13, 1918, he was ordered Overseas, but is pleased to state that after being trained by his Government for a year he never went to France, but went instead to Payne Field, West Point, Miss. At this point I recall that I looked at him severely and said, "Young man, just where did you defend this country from the attacks of the enemy?" Upon which he replied proudly, "At the Battle of Payne Field." This intelligence so staggered the historian—meaning me—that my writing became worse than ever, and the rest of it is as mixed up as a Naval contract. There are dates and several splashes. I believe a glass was upset right onto the great biography. Or George and I cried over it together. But something went wrong with it—I mean, more than already had been wrong with the damn thing. I decipher the words, "From there we took off—" and the rest is blurred. I suppose he took off his uniform there. But I don't know—and what does it matter, because I'm not guaranteeing this, anyhow?

But then I decipher distinctly the date, Aug. 27, 1920. That may mean something to George: it means nothing to me. Nor do the words, "Arcadia, Florida, which is still a town and has not yet been put back to acreage." But I get this, all right: "In 1920 George and Roger Williams started a school of destruction among the very simple peoples of Winter Haven, Florida." And Mr. H. E. Cornell, who landed twice at a cost of no less than $87 on each landing, was one of George's first pupils—and mighty simple he looked when I taxed him with being the Cornell in question—for I recall now that he was there. And in 1925 George and Ed were absolutely staggered to see me win over Casey Jones at the Dayton Races. (Casey had had a forced landing, truth compels me to add.) And that was the high point in the Haldeman life in 1925, so you can see he hadn't amounted to a thing at that date. And he didn't amount to a thing for the next two years. He and Ed Cornell did fly from Winter Haven, Florida, to the Pacific Ocean. But they stopped at the edge, so even that didn't get into the papers. But in August, 1927 he and Ruth



Eddie Stinson, Miss Ruth Elder, and George Haldeman.

"How To Use AVIATION INSURANCE PROTECTION Economically and Advantageously" . . . .

. . . . Is the title of our new brochure. Ask us for a copy. It explains also our free advisory service founded on 20 consecutive years' practical experience in aviation and supported by our corps of highly qualified aeronautical engineers and our staff of executives each one of broad practical experience in flying besides long training in insurance. Our long experience, knowledge and organization are at your service to assist in minimizing hazards with consequent reduction of operational costs and insurance rates, thus helping to improve, broaden and stabilize both your interests and our interests as Underwriters. Cooperation is the key to that result and is achieving remarkable improvements. Our success is founded on service and sympathetic cooperation fortified by long experience.

One of Many Unsolicited Testimonials

July 5, 1928.

Dear Sirs:

Independence Policy AC-1860

Thank you for the check in payment of my claim against the Independence Companies in respect of the accident which occurred on June 28, 1928. I would like you to express my thanks to Messrs. Barber & Baldwin, Inc. and the Independence Companies for the expeditious manner in which this matter was dealt with. The accident as you know occurred on June 28, 1928; the adjuster called on me on the next day and the following day I received the information from you that the claim was to be paid in full and that the check was being forwarded. The terms of settlement and the speed with which it was negotiated were surprisingly satisfactory. Furthermore, the fact that within a day or two after the accident I wanted to insure two more machines and they were accepted, speaks well for the soundness and consistency of the manner in which aviation risks are being handled by the Independence Companies through Messrs. Barber & Baldwin, Inc.

Yours very truly,
Carl E. Truhe.

Lowest Rates *Highest Indemnities*
Broadest Coverage *Quickest Service*

Policies have been issued over a long period of years and, among others, in favor of Federal and State Governments, Boeing Air Transport, Pacific Air Transport, Colonial Air Transport, Colonial Western Airways, National Air Transport, Western Air Express, Robertson Aircraft Corp., Colorado Airways, Northwest Airways, Walter T. Varney, Inc., Southern Dusting Co., Philadelphia Rapid Transit, Stout Air Service, Boston Airport Corp., American Railway Express, Ford Motor Company, Fairchild Aerial Surveys, Fairchild Flying Corp., Pacific Marine Airways, Pitcairn Aviation, United Cigar Stores Co., Royal Typewriter Co., Hamilton Maxwell, Inc., Pulitzer and other race meetings, Universal Motion Picture Corp., Fox Film Corp., American Airports, Inc., Jefferson Airways Corp., Midplane Sales & Transit Co., Stinson Aircraft Corp., Thompson Aeronautical Corp., Atlantic Aircraft Corp., Pratt & Whitney, Caddo Co., Chas. Rogers Productions, Canadian Transcontinental Airways, Ltd., Western Canada Airways, Ltd., S. C. A. D. T. A. of Columbia, S. A., Andian National Corp. of Columbia, S. A., Maddux Air Lines, Scenic Airways, Standard Oil Co. of Cal., Richfield Oil Co. of Cal., Transcontinental Air Transport, The Daniel Guggenheim Fund for the Promotion of Aeronautics, and many others including Col. Charles A. Lindbergh, Sir Hubert Wilkins, Anthony Fokker and other leaders in aviation.

Insurance Protection Available
aggregates over
$1,000,000 per aircraft

Constructive total loss
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Cargo (direct and liability)
Damage to ground property
Airport and Airmeet liability
Life insurance
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and
other forms constructed
as required

BARBER & BALDWIN, INC.
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GRAYBAR BUILDING, NEW YORK CITY
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B&B SERVICE

20 YEARS OF PRACTICAL EXPERIENCE IN AVIATION

air. It makes for a little variety and probably is all right for the lungs—so long as you can keep your whistle wet with something.

The first time I saw McInaney he was prowling around the corridors of the Baltimore Hotel, in Kansas City, during the first Ford Tour in 1925, telling the pilots about the new Eaglerock. Now, Mac hasn't changed very much since those days, but the Eaglerock has grown so you'd never recognize it, and so has the factory. For a large share of that growth Mac has been personally responsible. He inaugurated many of the popular merchandising features and has flown the ship in national meets, and shoved it all around the United States. In fact, he has been so busy that he hasn't had a spare minute in three years in which to get a hair-cut. If you don't believe me, turn this page back and look at the picture.

PILOT BOB Moore, the old reliable manipulator of the Seagull, which Harry Rogers firmly believes is the world's best boat, is now flying amphibians for the Loening Aeronautical Corporation. Last year, when I was in Miami, Bob spent the better part of an hour extolling the merits of a Seagull and a C 6; but last week he spent two hours telling me about the Loening Amphibian and the Pratt and Whitney Wasp, and was still talking as I moved off. It's a fine job, anyhow. I godunked a ride in Duke Schiller's Loening a while ago, all around New York harbor. Flying *de luxe*, that's all; a cabin as comfortable and only a little more noisy than the inside of a limousine, and a clear view ahead and on the sides and also straight down, or nearly so. The only way to see New York.

But about Bob Moore, he spent last winter flying in the Bahamas on Colonial Government service, carrying Governor Sir Charles Orr, and the Colonial Secretary, Hon. A. C. Burns, C.M.G., around the islands. With David Salter, chief engineer of the government radio service, Bob flew to the Island of San Salvador, the landfall of Columbus. Bob's Seagull was the first flying machine



The flamingos pose for Bob Moore.

to visit the very spot on which Columbus first set foot. I mean, it floated right near the spot, as you can see from the picture. About the only change Bob noticed was that they had built a wharf some time since 1492, so Columbus would recognize the old place if he went back there now.

The late Very Rev. Chrysostom Schreiner, who presided over the Mission at Riding Rock, San Salvador, was a student of the life of Columbus and had written a book about the explorer, who had charted the bay and described its various reefs and contours in his log. Father Schreiner went for a flight with Moore and could pick out all the reefs from the Chart made by Columbus, of which he had a copy. This aerial survey would seem to have set at rest any doubts as to the exact spot at which Columbus landed. San Salvador early became the rendezvous of buccaneers and pirates—and even to this day the shy, retiring form of the rum-runner may be seen by anyone not in the Coast-guard service. And, I should think, a very pleasant sight it would be to see the merry rum-runner at work, carolling gaily at his task of bringing a little spiritual warmth and encouragement into the lives of others.

Later, Bob flew to the Island of Great Inagua, 48 miles off the coast of Cuba, where in a small lake, by the use of three natives and the trusty Seagull, he rounded up a large flock of flamingos and made them pose for their photographs. They are huge birds, some of them standing six feet high, and weighing 150 lbs. In color they are pearl and pink, shading off to white. The picture shows only a few of a flock numbering hundreds, but an idea of their size may be gained by the figure of the man standing behind them. These great birds are fair fliers, but on the day when Bob found them they were so full of wild rice that they could not fly, and therefore had to stand and have their picture taken. There is a thought here for the Navy—if it isn't able to fly when the next war arrives, it may simply have to stand in the water and let the enemy take a picture of it. Why wouldn't a flamingo, stuffed with rice, make a good emblem for the Navy? The suggestion is respectfully offered to Mr. Secretary Wilbur, eminent historian of the antics of the little brown bear.

IF at any time you find yourself yearning to possess a Fairchild All-purpose Cabin Monoplane, the gentleman to see is Richard H. Depew, Jr.—whom you may call Dick if you're really going to buy anything, and Mr. Depew if you're not. He's one of the most pleasant fellows in the business to spend money with—in fact, he's so agreeable that you feel he is doing you a favor in taking your money. I believe that he feels that way about it, too. He really feels that he is saving you from the horrible error of buying anything other than a Fairchild, and that you owe him your thanks, as well as the price of the plane.



Dick Depew

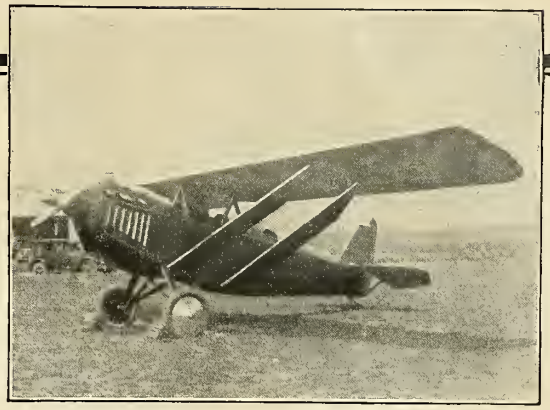
Since 1923 he has been Sales Manager and in charge of flying for the Fairchild Co., previous to which he was with Curtiss Export Co. and the old Exhibition Co. He learned to fly at the Farman School in Buc, France, and received the Aero Club of France License, No. 641, in 1911. During the war he was test pilot at McCook Field, with the rank of Captain, 1918.

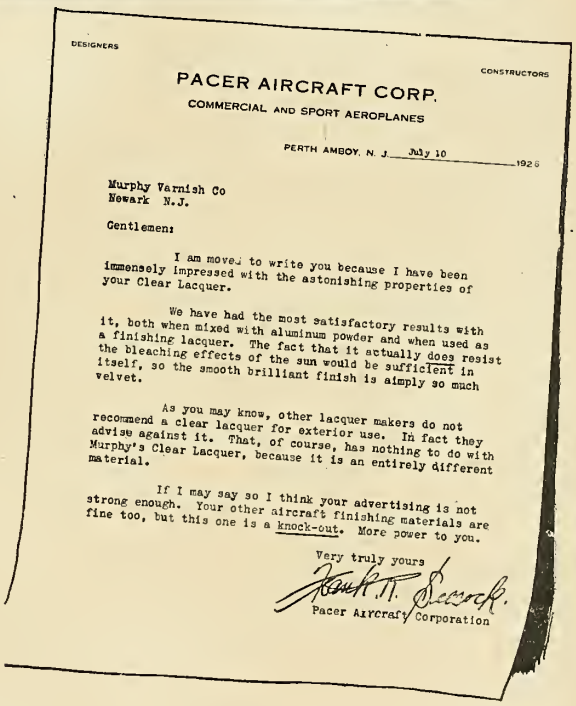


San Salvador, where they say Christopher Columbus made a successful one-point landing in 1492.

"—advertising not strong enough"

Pacer Aircraft Corporation





DESIGNERS CONSTRUCTORS

PACER AIRCRAFT CORP.
COMMERCIAL AND SPORT AEROPLANES

PERTH AMBOY, N. J. July 10 1928

Murphy Varnish Co
Newark N.J.

Gentlemen:

I am moved to write you because I have been immensely impressed with the astonishing properties of your Clear Lacquer.

We have had the most satisfactory results with it, both when mixed with aluminum powder and when used as a finishing lacquer. The fact that it actually does resist the bleaching effects of the sun would be sufficient in itself, so the smooth brilliant finish is simply so much velvet.

As you may know, other lacquer makers do not recommend a clear lacquer for exterior use. In fact they advise against it. That, of course, has nothing to do with Murphy's Clear Lacquer, because it is an entirely different material.

If I may say so I think your advertising is not strong enough. Your other aircraft finishing materials are fine too, but this one is a knock-out. More power to you.

Very truly yours
Frank T. Seesock
Pacer Aircraft Corporation

We thank Mr. Seesock for his suggestion about our advertising of Murphy Aircraft Clear Flexible Finishing Lacquer. Nevertheless we feel that the strongest thing we can do is merely to *state* the properties of this material, leaving the aircraft finisher to mentally adapt it to his needs, and to sell himself on using it.

Here are a few of the high spots of Murphy Aircraft Clear Flexible Finishing Lacquer.

It is Flexible—resisting the treacherous workings of aircraft surfaces.

It definitely resists the ultra-violet rays of the sun on wood, fabric and metal (the *only* lacquer we know of that will). This is most important, for it is the ultra-violet ray that dims, chalks, and destroys the ordinary finish.

It dries with a good gloss.

It has full body and gives an unusual depth of finish. It may be used as a finishing coat over colored spray lacquer, or mixed with it, to give it more protection and lustre, though, naturally its properties are best taken advantage of when used clear.

It can be mixed with aluminum powder to form an extremely lasting and durable finish. Metallic powders actually "leaf" in this material.

It forms a surface so smooth and hard that it may be thoroughly cleaned with a minimum amount of labor, thus eliminating repainting at short intervals.

We urge that you learn the full facts about Murphy Aircraft Finishes, particularly Murphy Aircraft Clear Flexible Finishing Lacquer. Either try out this unusual product right now and experience its remarkable properties at first hand, or send for further information.

MURPHY VARNISH COMPANY

Newark Chicago San Francisco Montreal

Murphy

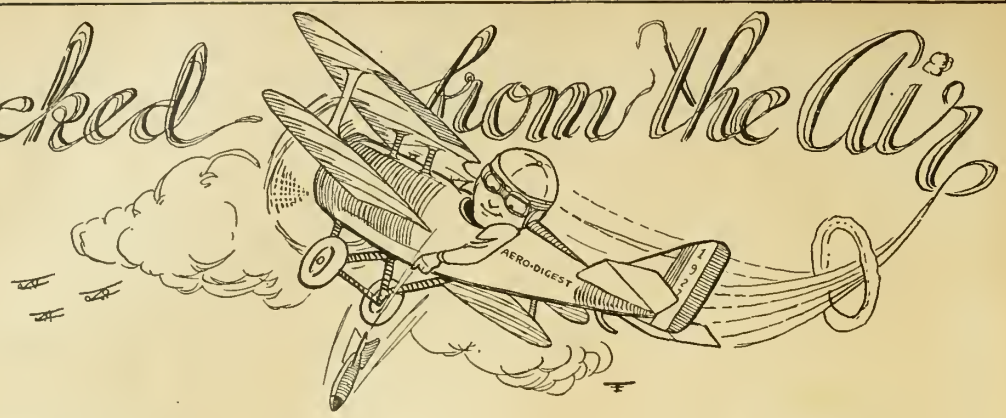
Aircraft Clear Flexible Finishing

Lacquer



Say you saw it in AERO DIGEST

Picked from the Air



AERO DIGEST will award a prize of $5 each month for the best humorous contribution published. Only those pertaining to the aircraft field will be considered. Address the "Picked from the Air" Department, Aero Digest, 220 West 42nd St., New York, N. Y.

Kenneth D. Stern, San Francisco, California, won the prize for August.

Dan Robertson of St. Louis, pilot of the Curtiss-Robertson "Robin" of the Ford Tour, while being shown the sights of Fresno previous to two blow-outs—a luncheon and a flat tire—in that city, was asked by his host (a native Fresnian and prune farmer of many wrinkles) just what kind of a plane he was flying.

"An O X Robin", replied Danny.

His host pondered over Dan's definition a moment, shook his head woefully, and spat.

"Well naow, pardner," came his reply, "I've heerd tell o' Cock Robin, but this hyar ox robin is a new one on me."

Civil Service examiner to young colored man: "How far is it from the earth to the moon, Rastus?"

Rastus: "Say, Boss, if you're goin to put me on that route I resign right away."

—John Vestal.

Back-Seat Flying

LOOK where you're going, Harry! You're up too high. You know it makes me nervous. What's the fun of flying if you can't see anything? I'd rather be down in the traffic and go a little slower. There! You passed another altitude post. Its positively dangerous. Hush up, Junior! Mother wants to go lower. It wasn't bumpy. There weren't any ruts in those clouds. Yes, that's better, Harry, but you could go lower yet. I can't make out the letters on Baker Brothers' floating sign and I know we're miles up—No, Junior, no! Stop it this minute. What did I tell you about throwing things down on church steeples? You ought to be ashamed!—what, Harry? Yes, it's better! I like this air road much better. Its the one Mrs. Jones' pilot always takes when he goes to market. I think its nice.

Oh—oh; land sakes, Harry! Watch out! Don't you know you've got your child with you? You almost hit that man's spare wing. Look how it's sticking out. He ought to be arrested, and he's not paying a bit of attention to the traffic blimp. Wait a minute. The air cop stopped him! I just want to hear what he says. Well, a careless person like that deserves every word of it. Now, there you go again, Harry! I can tell you're climbing. You can't fool me. Even if my father did use a motor car till I was a grown girl, I'm not so old-fashioned I don't know when I'm going straight up. An air pocket? Oh, for goodness' sake, Harry, get a new one! All right. Have it your own way. Our lives are in your hands! Wait—wait—for heaven's sake, wait! Don't you see that plane's giving you the parachute signal? Somebody's going to get out. What if it is a woman pilot? She's doing very nicely. I saw her signal as plain as day. There! She's dropped her husband. It's all clear now. You can go ahead.

We're coming to Marx's Hangar, Harry. Be careful here. There's always a jam. Watch out! Didn't you see him? I told you so. I don't care if you did have the right of way. What good'll it do if you're dead? Stop it, Junior? This minute! That lady doesn't want peanut shells on her wings. You'll not come next time. Oh, look out, Harry! There goes Mrs. Cardwell, our new neighbor. Why don't you stay on this avenue? I think it's nice. I do know her, too. Hasn't she got a snappy little plane? I saw her taking it out of the hangar yesterday. She's just ordered those blue wings. I suppose they're the last word. No, I wouldn't want them myself. I think they're affected, and they make you so conspicuous.

Oh, my gracious, Harry! look—look! There on your left! I never saw such flying in my life. Watch out! He doesn't know what he's doing. Honestly, the danger in flying isn't in what you do; it's in what the other fellow does. Sit down, Junior! How many times do I have to tell you, you can't get out on that wing? Certainly, you'd blow off, and don't try to tell me you wouldn't.

Here comes somebody acting funny, Harry. Two of them! They're racing. Would you believe it? Right on Air Avenue! They ought to be reported. One of them's a woman too. Watch out, Harry! He's trying to pass her. Oh, heavens, he hit her! He bent her wing. She's going down. Get his number, Harry. He didn't even stop. Another hit-and-run flyer! Yes, chase him. I don't care if he is climbing. Follow him up! We were that high a minute ago. Go on! You're gaining on him. There's a reward for anybody who reports a hit-and-run flyer. I guess I could use $500 as well as anybody.

—Clyde Kimball.

Martin Jensen thought he had had his full share of good luck when he flew across the Pacific in the Dole races last year, but now he knows that luck is still with him. In company with Bartlett Stephens, Assistant Superintendent of San Francisco's Municipal Airport, Jensen started to make a flight.

The plane speeded down the runway, started upward, careened to one side and nearly crashed when Jensen seized the dual control, righted the ship and held her aloft.

"Gee whiz, Bart!" Marty yelled, "that's the sloppiest take-off you ever made."

"Me?" replied Stephens. "Hell's bells, I thought you were at the controls. I wasn't."

—Wright Engine Builder.

The Flyway

The Airways Division of the Department of Commerce has an indefatigable correspondent who insists on calling an airway a "flyway". Someone has suggested that he must be a close relative of the man who thought it was necessary to use fly paper for an air mail letter.

A Straight Line

"What's the shortest distance between two points?"

"Lindbergh."

—Army and Navy Journal.

Daughter of old-fashioned man: "Do you realize, daddy, that we are the only people in this road who haven't an airplane?"

—Punch.

Aviator's companion: "What city are we over now?"

Aviator: "Look down and tell me what you see."

Companion: "Two holdups."

Aviator: "Chicago."

—Anthony Cirvelis.

BETTER AIRPORTS
WPM
AND ASSOCIATES

Security for Airport Investments is Scientific Drainage

Millions of dollars are being appropriated for airports throughout the country. Millions more are being invested in planes and other equipment.

Safety and permanency of this great investment can only be attained through immediate initial solution of the drainage problem, which attaches itself to each construction job.

The experience of hundreds of golf courses is that proper and adequate drainage saves a vast sum in costs of maintenance. Tax-payers can be saved even greater sums in relation to the maintenance of their municipal airports. Millions more can be saved on costs of planes which nose over in miry surface soil and dig wheels into unseen "ground pockets." It will be found that drainage, properly engineered, will conserve human life.

This organization, with a wealth of experience in relation to the country's leading drainage engineering projects, is making an exhaustive study of airport soils, ground cover which helps maintain a firm surface and sub-soil and other vital elements within the scope of drainage engineering.

Municipal authorities with the burden of the most permanent investment of public funds on their shoulders, airport operators with the responsibility of equipment and human safety on their hands are invited to consult us without obligation.

Modern scientific soil drainage prevents today the condition revealed by the costly accident of tomorrow.

We work co-operatively with the airport constructor or municipal engineer.



Wendell P. Miller
and Associates
Airport Drainage
Engineers - Constructors
208 South LaSalle Street
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85 East Gay Street
Columbus, O.

TECHNICAL

THE FUNCTION OF THE AUTO SLOT

By C. C. Walker, A.M. Inst.C.E.

Technical Director and Chief Engineer, De Havilland Aircraft Co., Ltd.

THERE are several ways in which the stall is defined, but instead of dealing with them now we will examine shortly what happens to the wing of an aeroplane at various angles of incidence right up to 90° so that all the phenomena connected with the stalling may be included. As we are not dealing with one particular wing section any actual figures given are only rough approximations. We will also consider the total force on the wing, i.e., lift and drag combined rather than lift only, for, at really big angles of incidence, lift —which is that part of the total force which is at right angles to the direction of motion relative to the air—ceases to be the preponderating element, and it is the total force which is really concerned with what is being discussed although over the usual flying range lift and tail force are so nearly the same that they are practically interchangeable terms. One other preliminary is necessary. The force on the wing naturally depends on its area, speed and the air density, and, as variations in these factors are not being considered, the force will be expressed by a coefficient which may be thought of as being in pounds per sq. ft. per speed per density.

Now there are two different régimes met with as the incidence is increased from 0° to 90°. In the first one, which extends up to about 15° incidence, the air is passing smoothly over the upper surface of the wing and producing suction there and pressure on the under side. At larger incidences, the air is unable to bend round the upper surface and breaks away in eddies. During this stage a part of the force which is obtained from the upper surface is lost, while the pressure on the under side continually increases. In the earlier régime the suction on the upper surface is greater than the pressure on the lower, and, in consequence, when the second régime is entered upon there is likely to be a substantial drop in the force on the wing as that part of it caused by the upper surface is to a great extent lost.

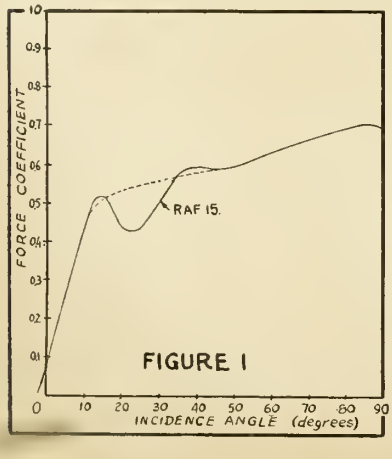


FIGURE 1

Starting from 0° incidence, where the force is practically all drag and is very small (about .005), it steadily increases to about 15°, where it becomes, say, ·60. It then falls away rather suddenly as the force on the upper surface is lost and comes down to about ·45 at 30° incidence. After this it gradually increases as the underside of the wing is presented more and more flat to the wind, until at 90° it reaches about ·7.

It will be seen then that after about 15° the increasing pressure under the wing does not balance the loss of suction above it, and an increase of incidence therefore produces a decrease of force on the wing between 15° and 30° incidence. This is of the greatest importance, as all the objectionable characteristics of the stall are due to this sudden loss of force with increase of incidence. Fig. 1, the data for which has been obtained from one of the reports of the National Advisory Committee for Aeronautics (NACA Report No. 273), gives a typical curve and displays the rapid fall off in force as the incidence is increased round about 15°. A wing rather similar to that used on the Moth has been chosen for this illustration. It shows that if (as is the case on most wings) we cannot get a greater force than ·45 during the earlier part of the second régime and we have been up to ·6 during the first, lateral instability with the inherent tendency to spin is bound to be present between 15° and 30° incidence. It will be obvious why this is the case. If one wing of an aeroplane in this condition drops or has its incidence increased, say, by a "bump" or use of the rudder or any other cause, it will experience a smaller force and will tend to drop further, producing still less force, and so on. It may eventually have ·6 on one side and ·45 on the other. A wing like this, if held on a pivot in a stream of air at an incidence between 15° and 30°, will rotate continuously like a windmill.

Turning now to a complete aeroplane, the state of affairs is modified by the presence of the tail and controls, but the same forces are acting on the wings. The controls of a Moth have sufficient power to overcome this unstable tendency when stalled, or even after a wing has dropped to bring the machine back to an even keel.

Further, if all controls are central a Moth will not spin. In emergencies, however, controls may not always be used correctly, and the more powerful they are the more improperly they can be used.

We may now return to a general consideration of stalling with a clearer idea of what happens. Every aircraft has a minimum speed at which it travels steadily. In a Moth this is about 40 m.p.h. This minimum speed occurs when the force on the wings reaches its highest value, say ·6 to ·7. This happens at about 15° incidence and again at about 90°. If it were possible to parachute vertically downwards on a Moth its speed along this vertical path would be 40 m.p.h., because the force on the wings is then round about ·7. This manœuvre is (fortunately) impossible on a Moth owing to limitations of elevator control, etc.

The effect of the slots is to remove, or partially remove, the sudden dip in the curve of Fig. 1 which occurs at about 15° and with which is associated all the objectionable features of the stall, and the way in which they operate is probably as follows: A part only of the wing is slotted and on this part the air breaks away later—at a bigger incidence and therefore higher lift. If the other part is stalled and is going down the dip in the curve, the slotted part has not yet reached this point, and instead of a drop in force is experiencing a continued rise. The net result on the whole wing is compounded of the two, and with the correct proportion of slotted and unslotted parts it is, at least theoretically, possible to get a total force curve which does not fall off at all and would therefore represent a wing which has no vices. An attempt has been made in Fig. 2 to show this.

The dotted line shows what would result if 35 per cent. of R.A.F. 31 wing section were slotted.

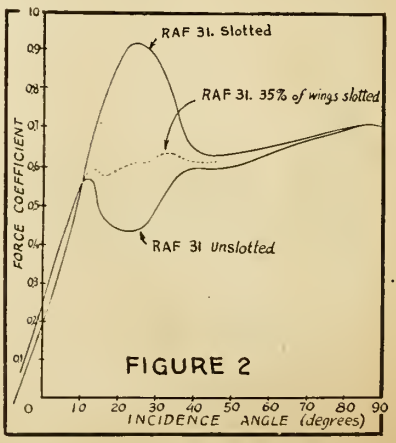


FIGURE 2

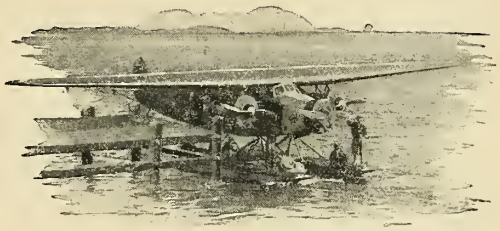


The Southern Cross flying above the Pacific Ocean on its course to Australia *Underwood & Underwood.*

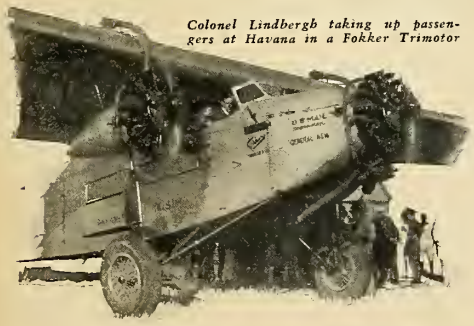
East Side, West Side—All Around the World!

HATS off to Captain Kingsford-Smith and his crew—to Miss Earhart and Pilot Stultz! Eastward with the *Friendship*, and Westward with the *Southern Cross*. Theirs was the spirit of unshakable confidence which, more than anything else, helps to inspire airmindedness in the traveling public.

Their chosen planes, too—Fokker Trimotors—continue to build up public confidence year after year. Kelly, Macready, Byrd, Bennett, Balchen, Van Lear Black, Koppen, Maitland, Hegenberger, and many other such names recall an endless chain of famous Fokker flights that have girdled the globe—events that unmistakably confirm the daily performance of Fokker Aircraft over leading European and American commercial routes.



The Fokker transatlantic trimotor seaplane, The Friendship



Colonel Lindbergh taking up passengers at Havana in a Fokker Trimotor

The position of the Fokker as the world's pioneer Trimotor grows more and more solidly established by the scope and reliability of its performance, by its unchallenged stability under all flying conditions, its simple sturdiness, and its reserve-engine safety. Pilots planning hazardous expeditions choose Fokker Aircraft with the same confidence that is manifested by commercial air transport operators who consider public safety, time-table regularity, and the practical economies of long life of equipment and low maintenance costs.

Specification of Fokker Trimotor types on Request
Send for our Informative book, "Some Practical Considerations"

ATLANTIC AIRCRAFT CORPORATION
Teterboro Airport, Hasbrouck Heights, New Jersey New York Office, 110 East Forty-second Street
Subsidiary of FOKKER AIRCRAFT CORPORATION OF AMERICA, *Wheeling, West Virginia*

FOKKER AIRCRAFT — SAFEST IN THE WORLD

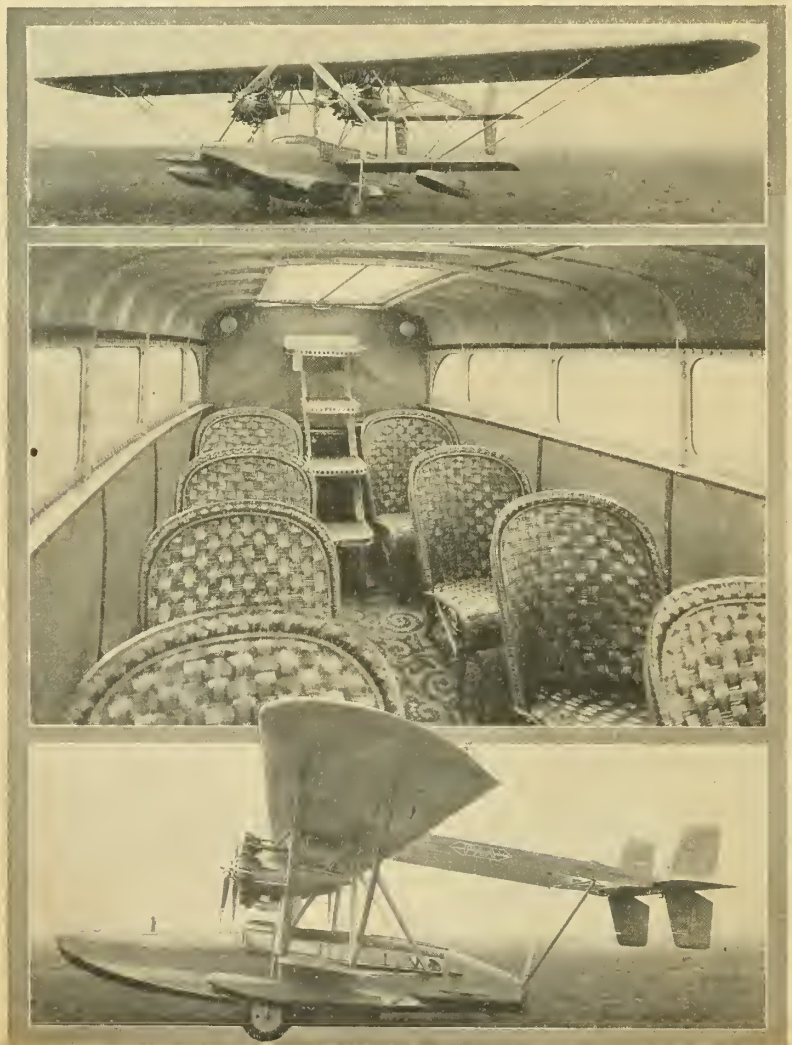
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THE SIKORSKY
Type S-38, Wasp Engined
AMPHIBIAN



THE Sikorsky Amphibian of the S-38 series was first tested two months ago. In this short time its fine performances have been attracting much favorable attention. The hull, 30 feet long by 62 inches wide with a single step is of composite wood and metal construction. The frame-work consisting of sturdy ash members all buttjointed is covered with sheets of "Alclad" a special non-corrosive duraluminum. By the aid of sponsons and a special bottom curve no spray is thrown against the propellers or the windows of the cabin either in taking off or in landing. The pilot's cockpit is in front of the cabin, arranged to have visibility in all directions. The control wheel is mounted on a central column, situated between the seats and arranged to be swung in place before either seat, thus ensuring a safe and quick transfer of control to either pilot. All controls are placed within reach of both pilots while the instrument board is artistically and carefully arranged, enabling easy reading.

Easy exit and access to the cabin is maintained through a sliding hatch in the rear of the deck. The cabin, seating nine passengers, is large and comfortable having 175 cubic foot capacity. It was designed to give ease and rest to the passengers when on long flights. The cabin is entirely clear of wires or members of any kind, there being a control box containing all engine and control cables rising from behind the pilot's seat to the upper wing. The cabin contains nine wicker chairs arranged with three directly behind the pilot's cockpit and then three groups of two chairs each. Another feature is that the cabin is insulated against outside noises; this, coupled with the mufflers used on the engines, results in a really quiet cabin. A lavatory is situated in the rear of the cabin. The interior of the cabin is finished in mahogany and leather.



The Sikorsky S-38 Amphibian powered with two Pratt & Whitney "Wasp" engines.

Two luggage compartments of fifty-two and thirty cubic feet are provided in the forward part of the hull. The total displacement of the hull to the upper chine is 27,100 pounds, while the weight of the ship fully loaded is 9000 pounds. The hull is divided by bulkheads and a water-tight floor in the cockpit and cabin making six water-tight compartments. Flotation of the ship is assured by the fact that the five compartments outside of the cockpit and cabin may be flooded and yet the plane will stay afloat. Each wing float is divided into two parts providing four additional water-tight compartments.

Besides designing the hull for its fine aerodynamic, structural, and load disposition qualities, thought was given to make it an ideal handling ship on the water. The maneuverability and controlability is such that the pilot may easily run the ship between two obstacles with just a few feet clearance at the wing tips. With one engine out the controlability may still be maintained by simply lowering the wheel on the same side of the active motor. No jar is felt by taking off or alighting on the water even when the plane is riding on the step.

The wings are of medium thickness and the airfoil used, the G. S. 1. is known for its high efficiency. The structure of the wings and ailerons is entirely of duralumin open sections covered with fabric. Spars consist of a Warren truss built up of two extruded "T" section members with channel cross bracing riveted in place. Wing ribs are of light duralumin channels built in a Warren truss. The ribs are also riveted, no welding being used in the wing structure. All struts are streamlined duralumin tubes while the fittings are of chrome-vanadium steel. The two outriggers are joined to the rear spar of the wing.

Self-compensating rudders insure complete controllability when flying on one engine. The

(*Continued on next page*)

Now! . . . Transcontinental Air Transport . . .
Aviation is still suffering from growing pains

The newspapers are full of aviation projects. Almost every day some new commercial plan is announced. A few materialize—many make interesting reading matter. The public surely follows this news with interest and wonder.

But what can the public do about it?

The public can't travel by air yet. There are only a few limited passenger air lines scattered about the country. The public can't use air express to any extent because it is available on only a few routes.

But air mail is an established service which can serve almost every citizen of the country. The public can patronize air mail more freely—it will—but it needs to be urged. And that's where the aviation industry should begin.

To sell aviation to the public, starting with air mail, there must be co-operation. Otherwise the cost will be prohibitive. The air mail contractors can't bear the whole burden, and they shouldn't. As the air mail prospers from increased public use the whole industry will prosper. That's why this task is one in which every operator, manufacturer and individual, interested directly or indirectly, should participate.

Leaders in aviation agree with our plan. They are ready to lend their full support. But we must still hear from a few more operators and manufacturers—those at a distance from New York—before we are ready to make any detailed announcement.

Aviation must first be sold to the public before the many aviation projects, now in the making, can hope to meet with their deserved success. We will be glad to explain our plan more fully to anyone in the aviation industry who is interested and will write us.

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We maintain a highly specialized department of aeronautics for the benefit of aviation clients, manned by men who know aviation by flying and working in its commercial developments. Our aeronautic files are comprehensive.

(*Continued from preceding page*)

stabilizer can be adjusted in flight enabling the pilot to fly hands off either loaded lightly or with full load. All the control surfaces are efficient and easy of operation, the ailerons being of a special balanced type.

The gas system used is the result of experiments on different systems as well as of different locations of tanks used on previous planes. In the S-38 the gas tanks are located in the center section of the upper wing, thus ensuring positive gravity feed. The system is arranged so that the gas will flow to either engine from either tank. There are two tanks built of heavy riveted duralumin of 100-gallons capacity each. The gas being outside of the hull lessens the danger of fire and also keeps the cabin clear of fumes. In case of emergency, the gas may be quickly dumped by means of valves controlled from the pilot's seat. Two additional tanks each of 200-gallons capacity located in the wing floats are provided.

The landing gear of an amphibian plane is one of the most important parts of the ship; it must be made sturdy to withstand the shocks of alighting on land and also an arrangement must be made to raise the gear so as to taxi or alight on water. The landing gear of the S-38 was developed embodying both shock absorbing and retractable qualities in a single unit. The shock absorbing and dissipation of energy due to landings are accomplished by means of an oleo gear working in conjunction with steel springs. This arrangement enables very soft landings to be made, transmitting no shock or jar to the hull; this is assisted by the tail skid which embodies the same principle of shock absorbing as the landing gear. The retractable qualities are obtained by a device made integral with the oleo gear. By operating a small hand pump in the pilot's cockpit oil is sent under pressure to the bottom of the oleo gear thus raising the whole mechanism. The time required to raise the wheels is thirty seconds while forty seconds are occupied in lowering them. This type of landing gear serves as an excellent emergency brake for land, the pilot simply raising the wheels, thus bringing the keel of the boat to the ground.

Performance Data—S-38

(With normal useful load 3200 pounds)

High speed	129.5 miles per hour
Cruising speed at 1650 r.p.m.	110 m.p.h
Landing speed	52 miles per hour
Climb to 1,000 feet	1 minute
Service ceiling	20,000 feet
Service ceiling with 4200 lbs. useful load	18,000 feet

General Data

Span of upper wing	71 feet 8 inches
Span of lower wing	36 feet 0 inches
Length overall	40 feet 3 inches
Gap	9 feet 3 inches
Chord of upper wing	100 inches
Chord of lower wing	59 inches
Area of upper wing	574 square feet
Area of lower wing	146 square feet
Weight empty	5,875 pounds
Normal useful load	3,200 pounds
Two Pratt & Whitney engines, each, 410 h.p.	
Load per horsepower	11.06 pounds
Load per square foot	12.60 pounds
Total hull displacement	27,100 pounds

THE STANDARD G-D-24

ANNOUNCEMENT of the specifications and details of The New Standard, a 5-place open cockpit, commercial sesqui-plane, has just been made by The Gates-Day Aircraft Corporation of Paterson, N. J., manufacturers.

The new ship, designated as the GD-24, has been designed and engineered by Charles Healey Day, a veteran with 22 successful types to his credit, including the famous Standard J-1.

The plane has been built as a real all-purpose ship, efficient for passenger "hopping", student training, cross-country mail or cargo carrying. Its main value, probably, lies in the fact that it carries four passengers and pilot.

The plane is adaptable to any engine ranging from 180 h.p. to 450 h.p. The specification figures are based on the ship with 180 h.p. Hispano-Suiza engine.

The wings are of wood construction, built up I-beam spruce spars and combined plywood and basswood ribs. The covering is of cloth except the ailerons, which have plywood covering on both sides. The stabilizer is of wood construction. The fin, rudder and elevators are of heat-treated duralumin.

The wing tips are of special design, tapered both in plan and thickness for about one-third of the span. The upper wings are divided into two panels with no center-section. Two gasoline tanks with a combined capacity of 56 gallons are inserted in the inner ends of the upper wings.

The leading edges of the wings are of waterproof plywood, and the trailing edges of heat-treated duralumin.

The three struts are of the N type, attached independently to the wing fittings.

The fuselage is constructed of standard shapes of duralumin, such as angles, ties, channels, with all parts riveted and bolted together. The fuselage is constructed entirely of open sections, which can easily be inspected.

The disposable load is located almost directly over the center of pressure. This permits of easy handling whether the plane is loaded to capacity or empty.

The tail skid is of chrome molybdenum steel tubing with the shoe bolted on. The entire assembly can be taken out by the removal of a few bolts at the bottom of the fuselage for the purpose of renewing the shock absorber cord.

The landing gear, of the split axle type, is of wide tread, eight feet, giving stability in landing and taxiing.

There is good range of vision for both pilot and passenger. There are no obstacles below the passengers and the pilot at all times can see his landing gear.

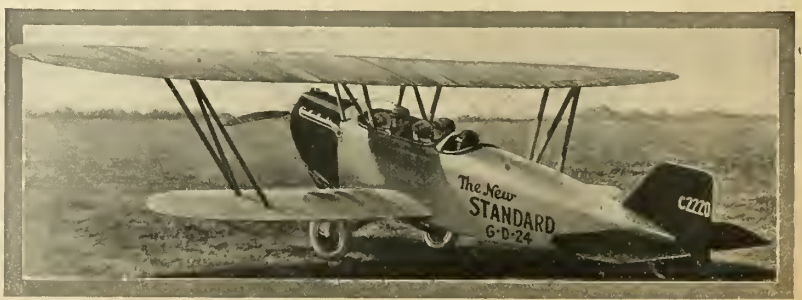
Entrance to and exit from the passenger compartments is made easy by small doors. Ample room for the passengers has been provided. The cockpit is 38 inches wide. All passengers face forward.

The all-purpose efficiency of the plane is shown by the manner in which it can be changed from a five-place job to a two-place or training ship, or into a mail or cargo carrier. A streamlined cover for the front cockpit is provided, and this may cover the entire cockpit or only half of it.

Another feature of the New Standard is in the placing of the radiator under the nose at such an angle that in the event of the plane nosing over the radiator will not strike the ground.

Specifications of the GD-24

Length over all	26 feet
Height	12 feet, 8 inches
Span of upper wing	45 feet
Span of lower wing	32 feet 6 inches
Seating capacity (including pilot)	five
Dihedral lower wing	2 degrees
Stagger	26½ degrees
Gap	72 inches
Chord, upper wing	70 inches
Chord, lower wing	50 inches
Wing area, including ailerons	350 sq. ft.
Stabilizer and elevator	40 square feet
Fin and rudder	16 square feet
Weight with water	1600 pounds
Power	180 h. p. Hispano-Suiza
Load per square foot	8.3 pounds
Load per h. p. with 180 h. p. engine	16 pounds
High speed with full load	105 m.p.h.
High speed, full load (front cockpit covered)	113 m.p.h.
Cruising speed, full load	90 m.p.h.
Landing speed	35 m.p.h.
Rate of climb	500 feet per min.
Service ceiling	12,000 feet
Fuel supply, with throttle open	4 hours
Disposition of load—	
Pilot and 4 passengers	850 pounds
Fuel	332 pounds
Oil	20 pounds
Baggage, etc.	100 pounds
Total disposable load	1305 pounds



Sketch showing the new Standard G-D-24 as it will appear when completed.



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PRODUCTION OF FORD TRIMOTORS

THE first automobiles were built under conditions and with facilities which limited tediously the manpower production capacity. Human hands had to do most of the work, from the fashioning of the parts to assembling of the whole. And since man first began to work with his hands, he has found time and time again that they simply are not sufficiently rapid and free from probable error to meet the demand for steadily increasing production.

But the automobile makers early began to devise manufacturing machinery and assembling methods that would multiply many times the manpower output. Today there is no industry in the world which presents such a marvelous combination of mass-production and precision workmanship as the automobile industry.

The Ford Motor Company probably has been the greatest single contributor to this amazing system which has virtually revolutionized industry in general, enhanced the value of man's power many times over and at the same time placed the product of his labor within the reach of such a vastly greater percentage of the world's population.

So, naturally, when the Ford Motor Company decided several years ago to go in also for the manufacture of commercial airplanes, it began to put into practice the production lessons it had learned from its years of experience in making automobiles.

And now there is the process of development at the airplane factory of the Ford Motor Company, at Dearborn, Mich., a system of manufacture and assembly which is certain to have a tremendous influence upon the airplane industry as a whole. For, just as in the case of the automobile industry, the business of making airplanes is certain to become more or less standardized as to production methods during the next few years. It is that sort of business. It is a very close relative of the automotive industry and will need the latter's highly developed system which is such a clever mixture of rapid output and fine workmanship.



The latest Model 4-AT Ford in flight.

Already the airplane division of the Ford Motor Company is operating on the "assembly line" basis which Ford made famous in automobile making. The same system of feeding raw materials in at one end of the factory and rolling out the finished product at the other, is in vogue today in the Ford airplane factory. Thus far it has assumed no such gigantic proportions as those of the automobile plants of the company. But the system is there and it is daily gathering momentum.

A little over a year ago one could count almost on the fingers of two hands the number of airplanes that the Ford Motor Company had built up to that time. The machinery of the "assembly line" had been moving very cautiously, for there was still considerable to be learned about the business of making airplanes that would certainly fly and as certainly carry a specified load safely and on schedule.

But gradually the system has been gathering speed and at this writing one big new, shiny, all-metal Ford monoplane, powered by three motors and capable of carrying a load of two tons at an average speed of a hundred miles an hour, is rolling off the Ford assembly line each week. The next step is two a week; then one a day—and eventually will come the day when airplanes will wing away from the Ford factory with clock-like regularity; dozens and scores of them each day.

Just what the product of the Ford airplane assembly line of the future will be is, of course, a question that only time will answer. It may be of a single standard type, or it may be a "line" of several types of Ford commercial planes. Henry Ford and his engineers have been doing very little public or private predicting as to what sorts of airplanes they will be building five or ten years hence. They are convinced only that airplanes, the finest that can be designed and built, will be needed in rapidly increasing numbers and that the Ford Motor Company must provide a great many of them to meet the growing demands in this new field of transportation.

The visitor to the Ford factory at Dearborn today wonders a bit just at first about the extent of the market for trimotored metal airplanes which will carry more than a dozen persons and cost approximately $49,000. Then he is told that the factory is away behind on its orders—that there are many would-be purchasers for each finished plane that comes out of the Ford factory today and that the production staff is bending every effort toward devising ways and means of speeding up the production rate.

At present the Ford Motor Company is standardizing on the trimotored monoplane built entirely of duralumin. The finished product, however, represents several minor variations in models. The standard and most popular model so far is known as Model 4-AT. Its specifications are as follows:

Dimensions

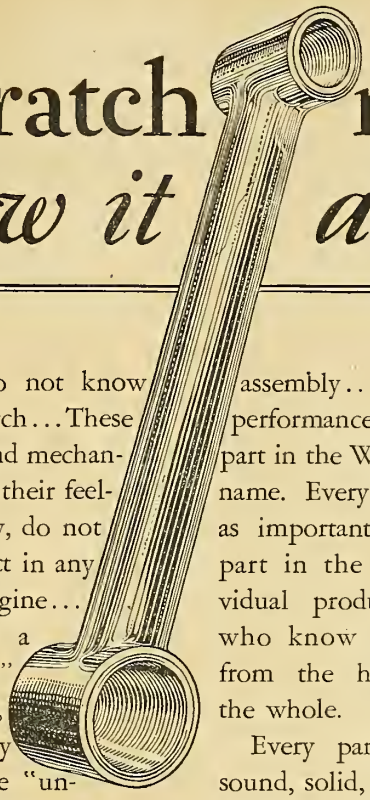
Span	74 feet
Length	49 feet, 10 inches
Wing area	785 square feet
Height	12 feet, 8 inches
Wheel tread	16 feet, 9 inches

(*Continued on next page*)



Ford trimotors on the "assembly line", showing the various stages of their construction.

A scratch means — "Throw it away!"



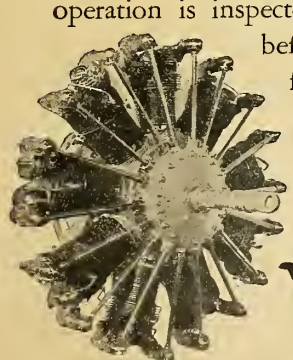
WRIGHT Workmen do not know how to "fix" a scratch... These men, whose high technical and mechanical skill is supplemented by their feeling of personal responsibility, do not know how to remedy a defect in any finished part for a Wright engine... Their only comment when a flaw is met is "throw it away"... A scratch however slight, a defect visible perhaps only through a microscope, is the "unlocked door" toward which stresses in the metal might strain for release.

That is why visitors to the Wright plant see discarded finished parts—to the average eye perfect in every detail—but to the searching eye of a Wright inspector unfit for service.

Nothing is left to chance in building Wright engines. Every operation is done by an expert in that individual field; every operation is inspected by another expert, before the completed, perfected and approved parts are accepted for assembly... There is no secret behind the performance of Wright engines. Every part in the Wright engine bears the Wright name. Every part in the Wright engine is as important as every other part. Every part in the Wright engine is the individual product of specialized workmen who know that the slightest departure from the highest standard may wreck the whole.

Every part in the Wright engine is sound, solid, tested and retested, made from the start to be tougher than the service it must give, and built from rough stock to assembly with full knowledge of its important function in the completed engine. Exactly what Wright engines will do is known.

For more than a decade Wright has been building engines with just such care as this... to produce aircraft power plants that measure up to the highest standard of excellence... an unchanging policy which explains Wright engine performance. That is why "more pilots fly them".



Wright "Cyclone" Aeronautical Engine

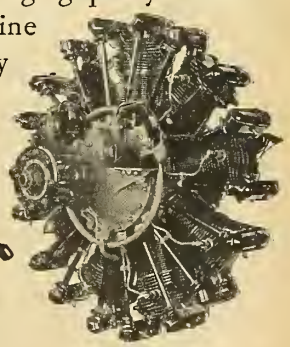
That's why More Pilots fly them!

WRIGHT

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Wright "Whirlwind" Aeronautical Engine

AUTHORIZED PARTS DEALERS

Air Associates Inc.—*Curtiss Field, Long Island, N. Y.* Pacific Aeromotive Corp.—*Los Angeles, Cal.* Stout Air Services, Inc.—*Dearborn, Mich.*

(*Continued from preceding page*)

Performance

High speed .....114 miles per hour
Cruising speed .....95 miles per hour
Stalling speed .....55 miles per hour
Radius of action (cruising) 570 mi. (6 hrs.)
Ceiling .....14,000 feet

Data

Weight, empty .....6100 pounds
Useful load .....3900 pounds
Total weight, loaded .....10,000 pounds
Gasoline capacity .....235 gallons
Wing load, per square foot.....12.74
Power load (pounds per h.p.):
2 engines 22.7
3 engines 15.15
Cabin capacity:
Width .....4 feet, 11 inches (average)
Height ..5 feet 1 inch to 7 feet 8 inches
Length .....15 feet, 9 inches
Passenger accommodation....350 cubic feet
(Seats for 10, removable; baggage hold, toilet, etc.)

Another model, of more recent design, is known as the "Ford Trimotor Transport for Operation at High Altitude." The specifications for this model are as follows:

Dimensions

Span .....78 feet
Length .....49 feet, 10 inches
Wing area .....835 square feet
Height .....12 feet, 8 inches
Wheel tread .....16 feet, 9 inches

Performance

High speed .....110 miles per hour
Cruising speed .....95 miles per hour
Stalling speed .....53 miles per hour
Radius of action (cruising).....570 miles
Ceiling .....14,000 feet

Data

Weight, empty .....6,300 pounds
Useful load .....4,500 pounds
Total weight, loaded.....10,800 pounds
Gasoline capacity .....235 gallons
Wing load, per square foot....12.9 pounds
Power load (pounds per h.p.):
2 engines 24.6
3 engines 16.4
Cabin capacity:
Width.....4 feet, 11 inches (average)
Height ..5 feet 1 inch to 7 feet 8 inches
Length .....15 feet, 9 inches
Passenger accommodation ...350 cubic feet
(Seats for 10, removable; baggage, toilet, etc.)

The third model is a high speed commercial transport, equipped with either two Wright Whirlwind motors and one Pratt & Whitney "Wasp" motor or with three "Wasp" motors. Its specfications are given below:

Performance

High speed.....121 miles per hour
Cruising speed.....105 miles per hour
Stalling speed.....59 miles per hour
Radius of action (cruising)
500 miles (4¾ hours)
Ceiling .....15,000 feet

Data

Weight, empty .....6,325 pounds
Useful load .....3,675 pounds
Total weight, loaded.....10,000 pounds
Gasoline capacity.....235 gallons
Wing loading, per square foot.....12.74
Power load (pounds per h.p.):
2 Wrights 22.7
1 Wright and 1 Wasp.....15.9
3 engines 11.8

Balance of specifications same as for plane equipped with three Wrights.

Equipped with three "Wasp" motors:

Performance

High speed .....130 miles per hour
Cruising speed....110 to 115 miles per hour
Stalling speed.....59 miles per hour
Radius of action (cruising)
550 miles (5 hours)
Ceiling .....18,000 feet

Data

Weight empty.....6,700 pounds
Useful load.....4,100 pounds
Total weight, loaded.....10,800 pounds
Gasoline capacity.....260 gallons
Wing loading, per square foot.....12.93
Power load (pounds per h.p.):
2 engines.....13.17
3 engines 8.78

Dimensions

Span .....78 feet
Length .....49 feet, 10 inches
Wing area.....835 square feet

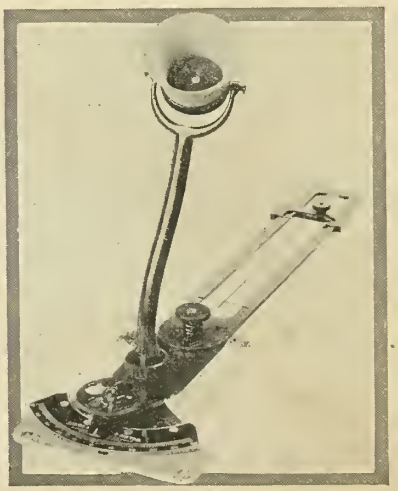
Balance of specifications same as for plane equipped with 3 Wright Whirlwind engines.

PIONEER DRIFT INDICATOR

A DRIFT indicator is a necessary auxiliary to a compass for accurate aerial navigation. An airplane may be headed on one direction yet because of contrary winds, follow a course in another direction. The difference between *heading* and *course* is the *drift angle*. In order to "make good" the desired course, it is imperative that the pilot or navigator know the drift angle so that he may calculate the heading and that the airplane be steered accordingly.

A practical way of ascertaining the drift is by observation of the ground, and a Pioneer drift indicator (or drift angle meter as the instrument is sometimes called) is used for this purpose.

This instrument may be mounted anywhere on an airplane where it affords an unobstructed view downward (vertically if possible, but at an angle if more convenient) and where it may be conveniently observed and manipulated by the navigator. The instrument is supported by a mounting bracket from which it may be quickly removed. It is sometimes advisable to install two or more brackets and to transfer the instrument from one to the other, according to the direction of drift or the convenience of the navigator. The mounting bracket must be installed with its center line either fore-and-aft or athwartship. Any error in its location will cause a corresponding error in drift readings.



The Pioneer Drift Indicator

To obtain the drift angle with the speed and drift indicator the support for the eyepiece is first made fast in a position which will be convenient for the user and also allow him to make his observation properly. It is not necessary that the eyepiece be directly over the wire. The operator then sights through the eyepiece at the drift wire and the ground below. The vane is now rotated so that objects on the ground or sea appear to travel along the drift wire. This means that the drift wire is now in line with the course being made good in respect to the ground. The drift angle, or angle between the heading of the plane and the course being made good, can now be read from the scale.

To obtain the ground speed, the vane is left in position corresponding to the drift angle and the slider is moved along the vane until the cross-wire is at the figure corresponding to the altitude of the plane above the ground over which it is flying. The altitude of the country over which the plane is flying must be subtracted from the altitude of the plane above sea-level to obtain the altitude of the plane above the ground. Looking through the eyepiece, the distance seen on the ground is that marked on the side of the vane—either one-tenth mile, four-tenths mile, or one mile. The scale which reads "one mile for altitude in thousand feet" can also be used for "one-tenth mile for altitude in hundred feet."

With a watch, the time of passage of an object from one wire to the other is noted, and reference to a table which is furnished with the instrument gives the corresponding speed in miles per hour. For example, let us assume it is desired to obtain the ground speed while flying at an altitude of 4,000 feet above the ground. The slider is first moved along the vane and the cross-wire set at the figure 4, which is on the scale marked "four-tenths mile for altitude in thousand feet." Assume the stop-watch shows the time of passage of an object on the ground between the fixed cross-wire and the movable cross-wire to be 12 seconds—reference to the conversion table will quickly show the speed to be 120 miles per hour. But if the table is not at hand, simple arithmetic will do. The distance seen on the ground between the cross wires was 4/10 mile and the elapsed time 12 seconds. This is at the rate of 1 mile in 30 seconds, 2 miles per minute or 120 miles per hour.

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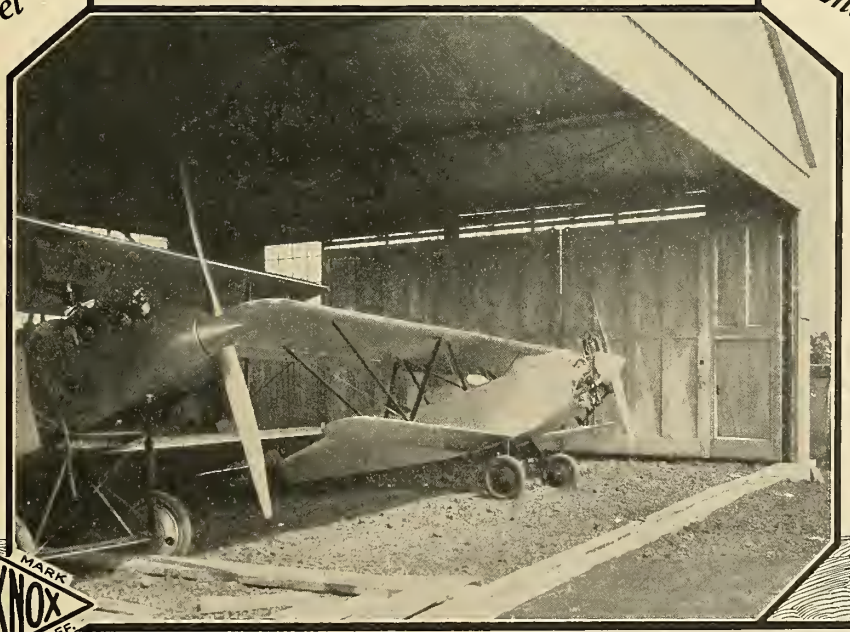
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BLAW-KNOX

ELIAS "AIRCOUPE"

THE Elias convertible monoplane, the E. C.-1, can be purchased either with an open cockpit or as an enclosed "Aircoupe" and is readily convertible from one type to the other.

It was designed by Joseph L. Cato in accordance with U. S. Department of Commerce regulations.

The E. C.-1 is the result of years of research and development work and the building, testing and flying of many designs.

This Elias Corporation of Buffalo, N. Y., has been well known for years as Contractors to both the U. S. Army and Navy, with a reputation for excellent workmanship in all their products.

Safety was the first consideration throughout the design of this plane, both in flying qualities and in structure. It has a flat gliding angle, low landing speed and quick response to the controls at all speeds. High factors of safety are maintained at all points. The landing gear is exceptionally rugged and has a very low wide tread permitting "ground looping" without danger.

Important fittings are in sight and easily inspected. The complete inspection of all fittings, controls, and the full length of all control cables can be accomplished in a few minutes, thus encouraging the continuance of this important routine.

Pilot and passenger sit side by side in comfortable and well upholstered seats with plenty of leg room, in a roomy and well ventilated cabin. Exceptional range of vision is provided through laminated safety glass windows in front and large sliding windows in the doors on each side. Unobstructed vision in this machine is one of its outstanding features.

The fuselage is low and can be entered through large and conveniently located doors on both sides. A baggage compartment is located under the streamline of the cabin over the fuselage, having ample capacity for small parcels. This compartment can be filled and emptied through the cabin door while standing on the ground, avoiding the necessity of getting into the cabin for that purpose.

By simplicity of design and interchangeability of parts, production costs have been reduced. Many parts are interchangeable such as right and left aileron, right and left elevators and rudder, and right and left fittings throughout the entire airplane. The only right and left hand parts are the wings and the landing gear Vs.

The fuselage is of welded steel tube construction, with no brace wires, a structure which cannot get out of alignment and being rust proofed, will have long life. Chrome-molybdenum steel tubing of extra diameter and wall thickness is used in the entire construction of the fuselage. The engine mount is also of steel tubing designed so that all parts of the power plant are easily accessible. The engine can be quickly detached from the fuselage by removing six mounting bolts. An efficient firewall is provided between the engine and seating compartment. The cowling is so designed that by moving a few keys it can be detached from the fuselage in a few moments. The fuselage covering is fabric.

The shock absorber of the landing gear is of Elias patented design. It is particularly durable and strong, there being no rubber cord, air pressure to maintain or glands that need attention. The load is taken by steel coil springs and bouncing is prevented by hydraulic cylinders. The tread of the wheels is exceptionally wide for a small machine—7 feet 3 inches. The tail skid swivels in the rudder post through 180 degrees and is steerable if desired. Working parts are located outside of the fuselage and can be readily inspected at all times.

The stabilizer is stationary and no adjustment is required as the entire useful load is carried near the center of gravity. Light or heavy loads do not affect the balance of the machine. The fin is adjustable on the ground to take up any motor torque that may exist.

The wing cellule is of the semi-cantilever type. The lift truss consists of two lift struts which do not attach to fittings welded to the fuselage, but are directly attached to tie rods running through the fuselage inside of a heavy gauge steel tube which also acts as a compression member. This method of attachment eliminates any danger of fitting failure at the fuselage through crystalizing due to vibration.

The upper end of the struts are also fitted with universal fittings, cut from solid nickel steel forgings, heat treated to 125,000 t.s. bearing on aluminum plates on the under side of the beams. This allows the inverted load to be taken on the under side of the beam rather than on the bolts that hold the side plates in place that carry the lift loads. The side plates are made from chrome-molybdenum steel, heat treated to 150,000 t.s. Structural tests of these lift struts show a tensile strength over 17,000 pounds, while the compression tests show a total support load over 9,300 pounds.

By the arrangement of the lift struts and the location of the aileron the possibility of aileron loads causing warping of the wings is eliminated.



Front view of the 80 h. p. Elias "Aircoupe" parasol monoplane.

Wings are constructed of wood with non-routed spruce beams. The rib webbing is of plywood with spruce cap strip. The entering and trailing edge is of heat-treated duraluminum. The inner ends of beams are connected over the fuselage with two five-eighths inch heat-treated nickel steel "T" bolts with an actual tensile strength for each bolt of 30,000 pounds. Large diameter bolts are used to provide proper bearing surface for the cabane struts which terminate together at the center of each beam between the wings. The internal drag or drift wires are 10-32 tie rods for the two inner bays and 6-40 for the outer bay or wing tip section. The wings, like the fuselage, are fabric covered.

The fuel tank is located above the wings over the fuselage, giving full gravity feed to the carburetor. Sufficient fuel is carried for four hours at cruising speed. The strainer and water trap is located in a convenient position where it can be cleaned without the necessity of removing any cowling. The system is so designed that a full supply of gasoline is assured to the carburetor at the most extreme angles of flight and with the elimination of any possibility for air traps. Flexible tubing connections are used for joints, large size copper tubing is used, annealed after forming.

Stick control and rudder pedals are used. All pulleys are of bakelite composition and

(*Continued on next page*)



Direct side view of the Anzani-engined Elias "Aircoupe" monoplane.



TRAINING PLANE DEVELOPMENT

The development of suitable training equipment for student pilots of the Navy has required years of concentrated effort on the part of Navy specialists, coordinating with aeronautical engineers in the industry.

A striking result of this consideration is afforded in the recently accepted Keystone "Pup," enthusiastically acclaimed by all who have seen and flown it.

Students are taught to Fly—then Observation, Gunnery, Bombing and Radio-Spotting—either Land or Seaplane.

Once again Keystone engineers have developed a product meeting all the desired requirements.

KEYSTONE

KEYSTONE AIRCRAFT CORP. BRISTOL, PENNSYLVANIA

Builders of the Keystone "Pirate" Bomber shown on the cover of this issue.

(*Continued from preceding page*)

are visible for inspection. The entire system operates lightly and is so designed that all slack can be readily taken up.

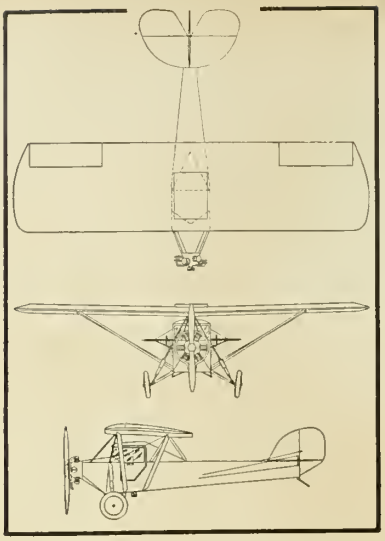
Control surface frames, including the ailerons, are welded chrome-molybdenum steel tubing and are rust proofed in the same manner as the fuselage. The covering is fabric.

The convertible feature as found in the E. C.-1 makes it possible at any time to change from an open to a cabin plane by the purchase of the required parts at a small cost. They are interchangeable with the original equipment without any fitting and the change can be accomplished in a short time without taking down or disassembling the airplane.

The standard equipment of the Elias "Air Coupe" includes the following items: Wood propeller, oil pressure gauge, oil temperature gauge, tachometer, altimeter, and a set of tools.

General Specifications

Wing span .....28 feet 1½ inches
Length overall .....20 feet 11 3/32 inches
Height overall .....7 feet 2 15/32 inches
Chord .....84 inches
Wing area with ailerons....192 square feet
Aileron area .....20.4 square feet
Stabilizer area .....13.2 square feet
Elevator area .....13 square feet
Rudder area .....6.4 square feet
Fin area .....3.6 square feet
Weight empty .....870 pounds
Useful load .....518 pounds
Pilot .....165 pounds
Passenger .....165 pounds
Fuel .....120 pounds
Oil .....14 pounds
Gross weight loaded.....1,334 pounds
Load per square foot of wing area.7 pounds
Dept. of Commerce gross design weight loaded .....1,388 pounds
Rated power (Anzani) at 1,600 r.p.m., 80 h.p.



Drawings of the Elias "Aircoupe"

Fuel capacity .....20 gallons
Reserve fuel capacity.....3 gallons
Oil capacity .....2 gallons

Performance

Maximum speed at sea level, 90 miles per hour
Landing speed at sea level, 30 miles per hour
Stalling speed .....34 miles per hour
Climb at sea level.....590 feet per minute
Climb in 10 minutes.....3,600 feet
Service ceiling .....10,000 feet
Cruising speed .....80 miles per hour
Cruising range .....400 miles
Fuel consumption at cruising speed, 5 gallons per hour
Oil consumption at cruising speed, .40 gallon per hour
Take off in dead calm.....within 125 feet
Landing stop in dead calm..within 100 feet

CIVIL SERVICE EXAM.

JUNIOR AERONAUTICAL ENGINEER, JUNIOR MECHANICAL ENGINEER

THE United States Civil Service Commission announces the above open competitive examination. Applications for junior aeronautical engineer and junior mechanical engineer must be on file with the Civil Service Commission at Washington, D. C., not later than August 7.

Full information may be obtained from the United States Civil Service Commission at Washington, D. C., or from the Secretary of the United States Civil Service Board of Examiners at the post office or customhouse in any city.

AC TACHOMETER

AN airplane tachometer made in high production is announced by the AC Spark Plug Company. This instrument, developed several years ago, has been used on the winning cars in the last three Indianapolis races. During the past season many thousands have been sold for marine use, and the recent marketing of a tachometer for outboard motors has given an added stimulus to production.

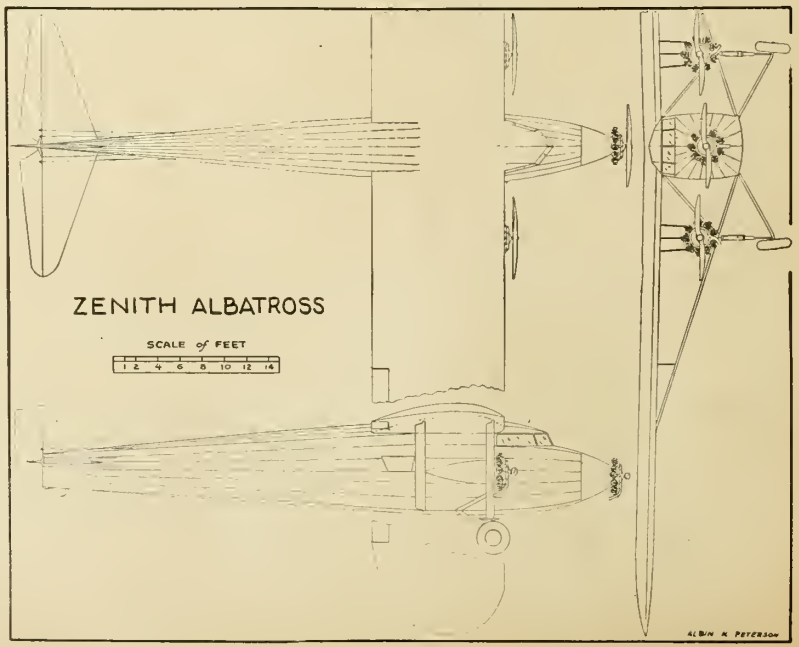
The tachometer head is of the magnetic type, compensated against temperature changes. There are only two moving parts, consisting of a light rotating armature, and a pointer mounted on sapphire bearings. Due to the complete shielding of the cadmium plated steel case, the tachometer has no detrimental effect on the compass. The dial is black, with white letters, and may be indirectly lighted. The bezel is brass, polished and then chromium plated. The instrument is assembled with a waterproofing compound, and sample instruments have successfully withstood a salt spray test of 150 hours, made according to the specifications of the Bureau of Standards.

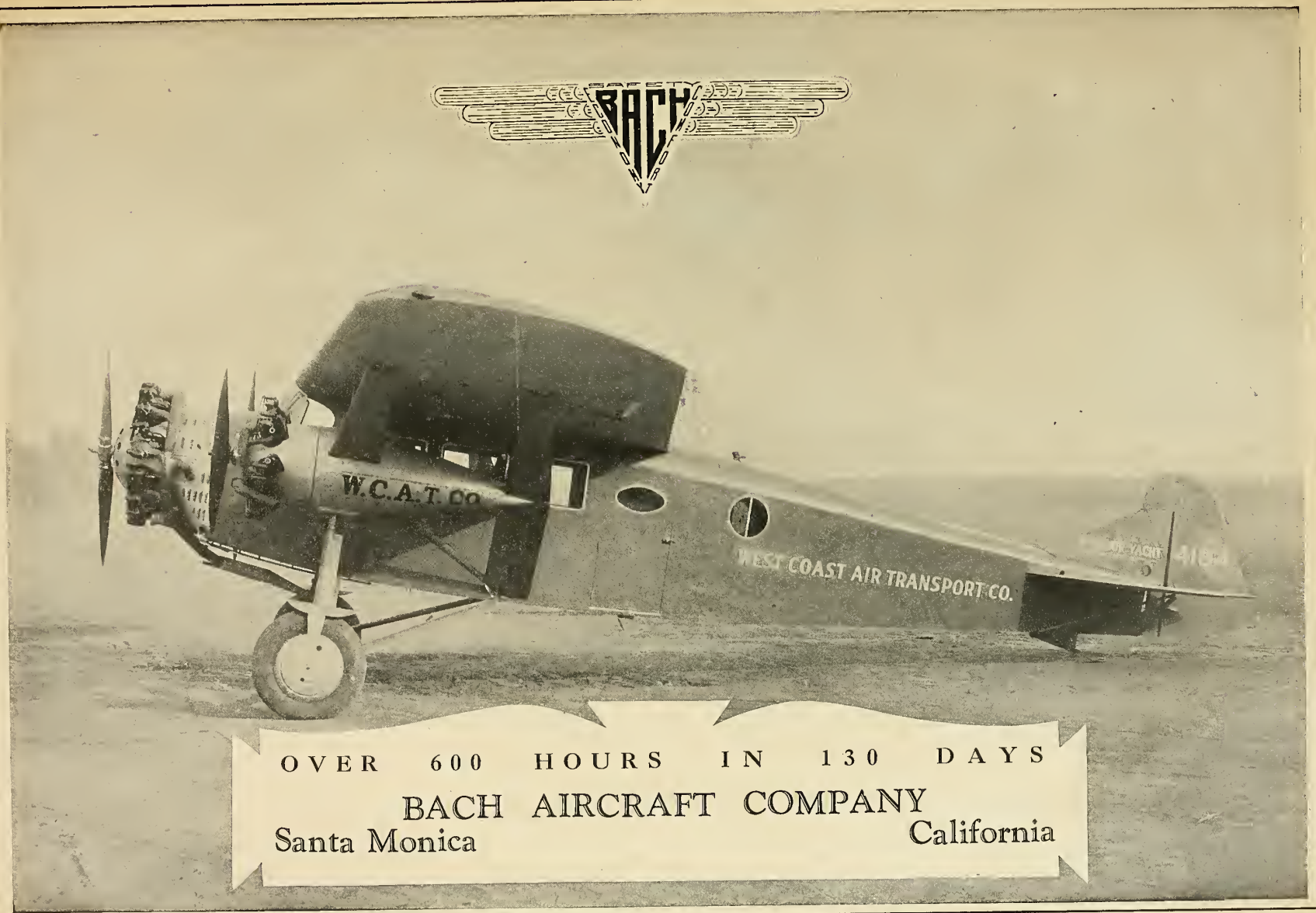
ZENITH ALBATROSS

THE accompanying drawing shows the outlines of the big Albatross monoplane produced by the Zenith Albatross Corp. of Santa Ana, California. This ship was tested last January and its flights since then have demonstrated its ability to take off with unusually high loads.

The following list gives some of the latest specifications of the Albatross:

Wing span .....90 feet
Overall length .....56 feet
Height .....12 feet 6 inches
Wing chord .....12 feet
Wing area .....1,032 square feet
Stabilizer and elevator area...62 square feet
Rudder area .....18 square feet
Fin area .....8 square feet
Dihedral .....3 degrees
Weight, light .....5,300 pounds
Weight, loaded .....14,950 pounds
Power, 3 Siemens engines..125 h.p. each
Wing loading..14.5 pounds per square foot
Power loading .....39.8 pounds per. h.p.
Gas capacity .....1,300 gallons
Oil capacity .....65 gallons





OVER 600 HOURS IN 130 DAYS

BACH AIRCRAFT COMPANY

Santa Monica California

Say you saw it in AERO DIGEST

Endurance and Distance Records of the SAVOIA-MARCHETTI S-64

By
Dr. Michael Watter

THE unusual features of design of the Savoia-Marchetti S-64 are an interesting departure from standard landplane design practice, approaching more closely a combination of sailplane and flying boat arrangement. A study of the available data on the S-64 reveals several distinctly interesting and advantageous points in its design and while not entering into a detailed discussion of practicability or future possibilities of a plane of this nature, a few comments on the aerodynamic and structural characteristics of the Savoia S-64 will be made.

The statement by the designer Mr. Marchetti that the plane was purposely built for duration and range record strictly defines the purpose of the plane and indicates directly that the greatest proportion of the useful load will be contributed by fuel. Practically all of the successful competitors of the Savoia S-64, particularly here in the United States, were externally braced monoplanes with extra big cabins to house the large amounts of fuel required by flights of this nature. While this may be a practical way to design an airplane with a view to converting it into a passenger-carrying craft, it is certainly not an efficient way to carry fuel and if the plane is purposely designed to attain maximum duration and distance it is only logical to store the fuel in a thick cantilever wing, reducing the size of the cabin to the minimum required by the comfort of the crew. This feature is one of the distinct aerodynamic advantages of the Savoia S-64.

Since the amount of load usually carried in flights of this nature is abnormally large, the storing of the fuel in the wing brings forth the structural advantages of this arrangement; instead of a high concentrated load in the fuselage the masses are distributed along the span and so reduce the structural weight of the wing and simplify and lighten the weight of the remaining structure. Other features of Mr. Marchetti's design are probably partly suggested by his flying boat experience but even they seem to have several advantageous features. Placing the engine nacelle high above the wing improves the visibility of the pilots located in the loading edge of the central portion of the wing. This arrangement also permits the employment of considerably shorter landing gear members with a consequent reduction of their weight and resistance, while trussed booms for the tail support do away with the large fuselage which is otherwise necessary.

The successful outcome of both the endurance and distance flights of the S-64 is a tangible proof of its characteristics and a practical demonstration of its performance possibilities.

The following information on the S-64 is a partial translation of an article prepared by the designer of the plane and submitted for publication in AERO DIGEST. Of course our comments of the performances and structure are based upon this information and the assumption of their accuracy.



The Savoia-Marchetti S-64 has a flying range of 7,050 miles.

The technical significance of the endurance record recently made by the Italian Savoia-Marchetti monoplane lies in its demonstration of the maximum non-stop distance the airplane is capable of covering. Distance and duration records are, however, strictly distinct because of dissimilar conditions under which they take place. If, however, the equipment of the plane, loading conditions, etc., are identical, one record bears a definite relation to the other and an endurance record is the first logical step in attempting a maximum non-stop distance flight.

In the case of an endurance flight, the craft is flown at a very low speed because speed requires power and in order to stay in the air the maximum possible time, the pilot must vary his speed with the natural decrease of the weight of the plane, flying at angles of attack corresponding substantially to the minimum propeller thrust. For the case of maximum range the flight must be made at angles of attack corresponding to minimum consumption per mile, but in actual practice, the flight is made at slightly higher speeds.

To attain the maximum performance the conditions of flight are studied theoretically beforehand and the pilot adheres as closely as possible to a predetermined schedule, making use of special equipment and instruments.

The Savoia-Marchetti S-64 is a single-engined cantilever monoplane similar in many respects to the Savoia Santa Maria S-55 of de Pinedo fame. It is also designed by Mr. Marchetti, the designer of both airplanes used by de Pinedo in his famous flight. With the exception of the fact that the S-64 is a land plane, its similarity in design to the S-55 can be traced to a cantilever wing structure with an engine nacelle, supported high above it in a flying boat fashion, a short fuselage and tail surfaces supported by two trussed booms or outriggers.

The S-64 is another characteristic example of the original ideas of Mr. Marchetti and their practicability is amply indicated by the two recent exploits of Ferrarin and Del Prete.

The S-64 was expressly designed for maximum endurance and distance records and represents in its details minute researches for maximum aerodynamic fineness and optimum structural arrangements. An indication of its superior aerodynamic design can be gathered from the fact that the maximum L/D of the S-64 is 15 with radiator exposed and 16 with the radiator housed. This high aerodynamic fineness is an achievement worthy of high commendation. A thorough study of the structure resulted in an extremely low value of the ratio of the weight empty to the gross flying weight (equal to 0.34) another indication of its superior characteristics.

The cantilever wing of the S-64 is of three-beam construction covered completely with plywood. The wing profile is tapered from medium thickness at the tips to a thick section at the roots. The interior wing volume is used to house 27 fuel tanks which take up three-quarters of the entire wing span. The piping

(*Continued on next page*)



The Savoia-Marchetti monoplane which was flown from Italy to Brazil.

GLORIES OF THE "SALVATOR" PARACHUTE



AT CINISELLO (Milan)

Pilot Ferraro made a safe descent with a "Salvator" Parachute after a delayed opening of 300 meters.

AT TORINO

When Pilot Donati recently broke the world's record for altitude flights, he carried a "Salvator" Parachute.

AT CENTOCELLE (Rome)

Major Cuntry, although suffering from burns received when his plane caught fire, managed to land safely with a "Salvator" Parachute.

ON THE FLIGHT FROM ITALY TO BRAZIL

When Pilots Ferrarin and Del Prete made their recent record long distance flight from Rome to a point near Pernambuco, they wore "Salvator" parachutes.

ON THE NOBILE RESCUE EXPEDITIONS

Pilots Maddalena and Penzo relied upon "Salvators" to safely float provisions and supplies from their plane to the stranded Arctic explorers.

S. A. BREVETTI AERONAUTICI

"Salvator"

VIA IN LUCINA 15
ROME

(*Continued from preceding page*)
system permits selection of the flow from the various fuel tanks to take care of any stoppage or leakage and also to correct conditions of balance of the airplane.

The cabin for the crew is located inside the wing in the center and its top projection is well streamlined to minimize the resistance. In addition to pilot's quarters there is a place where the pilot can sleep. The equipment is complete and all the instruments are duplicated for safety and convenience. The instruments include the following:

Three compasses, one magnetic, one gyroscopic, and one of the earth inductor type.

Radio set with dynamo and batteries with a radius of about 700 miles.

Heating and illuminating systems with a separate dynamo.

An artificial horizon with a separate dynamo.

Gyroscopic indicators of trim.

A powerful landing light with batteries and accumulators.

This elaborate equipment minimizes considerably the dangers of a long nonstop flight and places it on the basis of a sound technical enterprise.

Specifications

Wing span.....70.5 feet
Length over all.....29.5 feet
Height over all.....12.1 feet
Wing area .....646 square feet
Weight empty.....5,290 pounds
Useful load (maximum....10,120 pounds
Ratio of weight empty to gross flying weight.....0.34
Gross flying weight.....15,410 pounds
Fuel capacity.....1,720 gallons
Oil capacity.....53 gallons
Load factor from maximum loading condition....4.5
L/D maximum 15
Maximum speed (medium loading) 146 miles per hour
Maximum range .....7,050 miles
Horsepower—Fiat A22..... .500 h.p.
Horsepower loading..30.9 pounds per h.p.
Wing loading ....23.8 pounds per sq. ft.

BRISTOL TITAN AIR-COOLED ENGINE

THE Bristol Titan is a five cylinder aircooled radial of medium power intended primarily for use in commercial or service instruction planes.

Designed specially by the Bristol Company of England in order to complete their range of aircooled engines, it embodies the same high standard of design and workmanship as the famous Bristol Jupiter, with which the major components are interchangeable—a feature of particular importance from the stores and replacement point of view and making the Jupiter-Titan combination particularly attractive for commercial and service use.

The chief characteristics of the engine are reliability, robustness, simplicity and low cost of upkeep. To bearing surfaces, which are of ample area and well lubricated, particular attention has been paid resulting in low bearing pressures and great economy in oil consumption.

The induction system embodies an engine-driven mixture distributor fan, owing to the impossibility of using the well-known Jupiter spiral induction system on a five cylinder engine.

The carburetor is a duplex oil heated type embodying the highly satisfactory features of the Bristol Triplex Carburetor, as fitted to all Jupiter engines. An oil heated induction elbow attaching the carburetor to the mixture chamber ensures good vaporization of the mixture under all flying conditions.

Jupiter cylinders and pistons as well as many other important components are used, while the design of the crankshaft and connecting rod assembly embodies latest Jupiter practice.

The various auxiliary drives and accessories are grouped at the rear of the engine, giving them full protection and allowing a simple cowling to be used.

A standardized conical mounting, projecting rearward from the back of the engine allows the front of the engine to be dismantled without removing the complete engine from the plane.

Provision is made for the well-known American Eclipse Inertia starter to be fitted.

The development bench tests on the Bristol Titan engine have been satisfactorily completed, and, as a further stage in its development, experimental flight tests were carried out in a converted standard training machine.

During the course of these tests the machine was flown to the airdromes of the principal aircraft firms and handed over to their test pilots for demonstration test flights in order to obtain an independent opinion on the flying qualities of the engine. The general impression of all the pilots who flew the machine was that the running of the engine was exceptionally smooth and pleasing.

The Titan engine has been granted a British Air Ministry Civil Type Test and accepted as airworthy under the Air Navigation Regulations and Directions Act.

Bristol Titan Series II

(*Commercial Engine*)

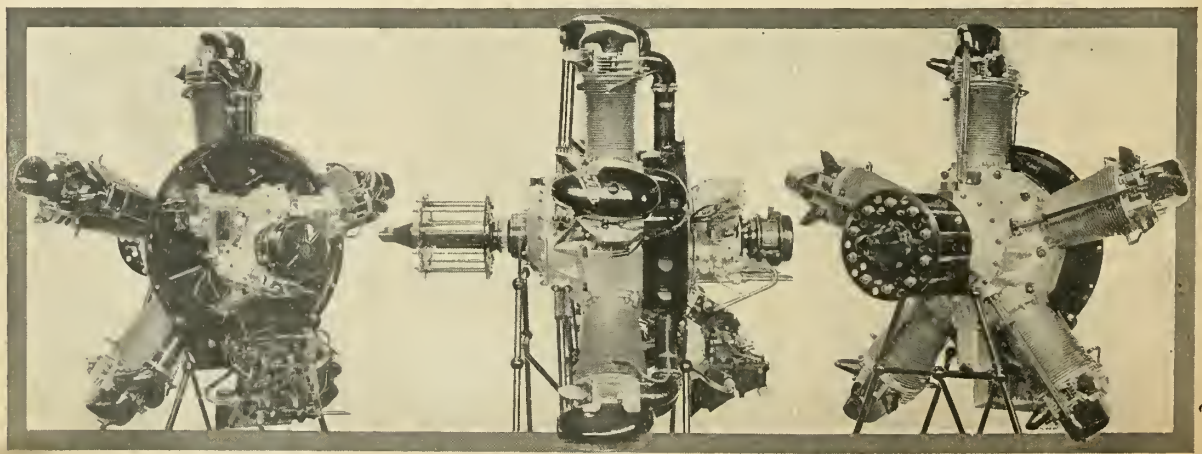
Bore.....5.75 inches (146 mm.)
Stroke.....6.5 inches (165 mm.)
Total swept volume 842 cubic inches (13.8 liters)
Compression ratio.....5 to 1
Power rated.....200 b.h.p. at 1700 r.p.m.
Maximum power..220 b.h.p. at 1870 r.p.m.
Propeller.....direct drive L.H. tractor
Ignition.....dual 2 H.T. magnetos
Lubrication system.....pressure
Tachometer drive.....¼ engine r.p.m.
Dry weight.....500 pounds
Fuel consumption.....13 gallons per hour
Oil consumption.....2 pints per hour

Bristol Titan Series III

(*Service Engine*)

Characteristics of the Titan Series III are similar to the Series II except for the following:

Compression ratio.....5.3 to 1
Power rated.....220 b.h.p. at 1700 r.p.m.
Maximum power....240 b.h.p. at 1870 r.p.m.
Fuel consumption.....14 gallons per hour



Views of the 200 h.p. Titan Series II commercial type aircraft engine, produced by the Bristol Company of England

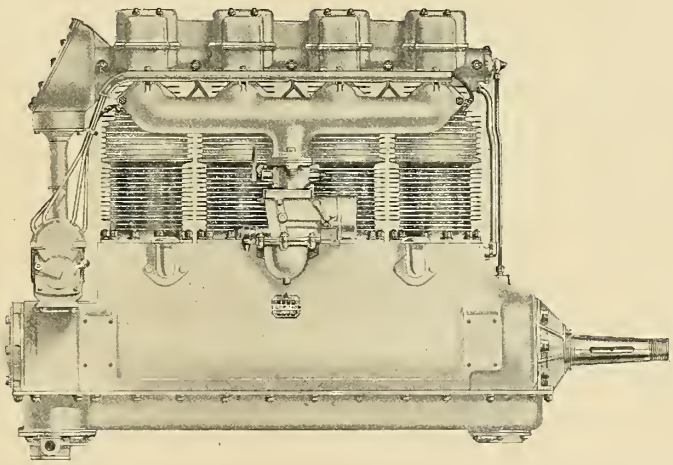
4 -IN LINE- SCORPION AIR COOLED
REGISTERED TRADEMARK

AERONAUTICAL PRODUCTS
CORPORATION
MANUFACTURERS
NAUGATUCK, CONN., U.S.A.

The Aeronautical Public—

Gentlemen:

Here it is---our new 4 cylinder-in-line, air-cooled, overhead valve "Scorpion". 100 H.P. plus, at 1800 R.P.M.--and it weighs only 290 pounds. The "Scorpion" may be installed in any type of plane now being used.



I honestly believe this to be the biggest $1825 worth of aircraft engine ever placed on the market. If you care to investigate, I'll be pleased to show you why.

Yours very truly,

AERONAUTICAL PRODUCTS CORPORATION

President

ALL MATERIALS U. S. AIR SERVICE REGULATIONS

QUOTATIONS SUBJECT TO CHANGE WITHOUT NOTICE. ALL AGREEMENTS CONTINGENT UPON STRIKES, ACCIDENTS AND OTHER CONDITIONS BEYOND OUR CONTROL

THE U. S. FLYER

THE U. S. Flyer, a product of the U. S. Airplane Co. of Chicago, Illinois, is a two or three-place open cockpit type with a bucket type seat for the pilot and a bench seat for the passengers. Russialoid upholstery is used throughout. The duralumin flooring is removable. A Bakelite dash is installed with Consolidated instruments in an indirectly lighted panel in the pilot's cockpit. Stick control is used; pedals for the rudder. A special self-starter is operated from the pilot's cockpit.

The landing gear is of the split axle type built of carbon steel and nickel steel. Disc shock absorbers and aluminum disc wheels are used.

The tail skid is a steel spring having a Stellite coated shoe. Ailerons are of wood and duralumin structure. Tail surfaces are of welded steel and duralumin. The horizontal stabilizer is adjustable. The control system is dual. Elevators and ailerons have push and pull tubes; the rudder is operated by cables. The stabilizer has push and pull tubes and lever control. The gravity gasoline tank, of duralumin, has a capacity of 48 gallons.

The fuselage is of welded steel tubing, faired to semi-oval section by means of light steel tubing and spruce fairing strips.

The Clark Y wing section is used with plywood gusset type ribs having Sitka spruce capstrips and bracing. Gussets are of Haskelite waterproof mahogany plywood. Casein waterproof glue is used. Ribs are dipped one coat of shellac and one coat of Valspar. False ribs are built of duralumin channel. The trailing edges are of duralumin; leading edges of spruce. Tip bows are of laminated spruce which serve to shield the ailerons.

Wing fittings are spar-box of carbon steel at roots on all spars, semi spar-box fittings at struts. Hinge fittings are welded to spar boxes and bolted, two bolts through spars. Internal wiring is with Macwhyte tie-rods and external wires are Macwhyte streamline wires. A safety factor of seven is obtained on wires. End ribs are of birch plywood. All fittings are buried but are readily accessible through inspection doors. Dartmouth-Tex Grade A fabric is used for all covering, treated with Van Schaack nitrate dope. Berryloid finish is used on all metal and fabric, giving them an attractive protection.

Specifications—U. S. Flyer

Span, both wings	33 feet
Wing chord	5 feet 6 inches
Gap	5 feet 6 inches
Dihedral	2 degrees
Stagger	11 inches
Areas (square feet)	
Wings	320
Ailerons	50
Stabilizer	22
Elevators	16
Fin	3.5
Rudder	11
Weights (pounds)	
Weight, light	1200
Weight, fully loaded	2000
Useful load	800
Performances	
High speed	100 miles per hour
Cruising speed	85 miles per hour
Landing speed	35 miles per hour
Rate of climb	600 feet per minute
Service ceiling	12,000 feet
Absolute ceiling	13,500 feet
Cruising radius	425 miles

THE SZEKELY ENGINE IS FLIGHT TESTED

THE Szekely SR-3 engine recently made a very fine test performance flight. Carl Lutzenberger made the trip of 425 miles from Holland, Mich., to Erie, Penna., in 4 hours and 18 minutes, using approximately 10½ gallons of gasoline. The oil consumption was a little heavier than expected—approximately 3 gallons. However, this report was given without checking the amount of oil left in the bottom of the tank, the discharge of the oil pump or the bottom of the seepage compartment of the crank case, at the end of the trip.

The following day he flew the same distance, against the wind, using 13½ gallons of gasoline and a little less oil. The speed of the plane was nearly 100 m.p.h.

A ROOF TOP LANDING FIELD IS SUGGESTED

A PLAN has been suggested for a means of providing a comparatively large area in a roof landing field for the business sections of large cities by George Osborn, an aeronautically inclined inventor, who is endeavoring to promote the venture for New York City by interesting the city government and associations and individuals interested in the promotion of aviation.

Under his plan two square blocks would be chosen where one street length is extra long and the other about half that length and where a number of the buildings are high and of almost a common height. Extra stories would be added to some of the buildings wherever feasible to bring the majority of them up to the same level. An extra story would then be added to these buildings for storage hangar purposes and the entire area roofed over. Over the street, the low buildings and the gaps caused by irregularities in the architecture of the buildings, the field would be supported by steel structure. At these points a glass block flooring would be used to permit the passage of light. The hangar floor would be set back from the building edge to permit the construction of a balcony at the hangar floor level entirely surrounding the field as a safety factor. Plane elevators between the field and the hangars and passenger elevators to the street would be provided. A large illuminated arrow would be turntable mounted at the center of and flush with the field for indicating wind direction.

The inventor is seeking support for the project on the basis that such a construction would provide sufficient runway (about six hundred feet) for a large number of planes now in use, especially if lightly loaded and would hence salvage the speed advantage of the plane on short hops, widening the field of this activity through convenience. At the outset the field would hence operate as an air taxi station for the rapid transport of passengers, mail and merchandise between the business center of the city and the various suburban fields and other points. As to its promotional value to aviation he points out that as it would require from one to two years to promote and complete and as during this time it would receive a great amount of national publicity, it would be an inspiration to plane manufacturers to devote more attention to the problem of slow landing in order to construct planes able to make extensive use of the field and hence having greater marketability, it being probable that many new types would be developed by the time the field was finished. It would in this event be only a short time before the field should become a profitable venture.



Views of the 110 h.p. Anzani engined U. S. Flyer now in production by the U. S. Airplane Co.



THE PITCAIRN SUPER - MAILWING

Air mail poundage is mounting rapidly. To meet the demand for a high-speed ship capable of carrying the ever-increasing loads, the Super-Mailwing (PA-6), has been designed and will be ready for delivery to operators early in August.

The plane has a cargo space of forty cubic feet, nearly twice the capacity of the Mailwing (PA-5) and can accommodate 500 pounds of mail. This has been accomplished by an increase of only twelve inches in the over-all length of the ship. Gasoline capacity has been increased twenty gallons, with a commensurate increase in oil capacity. The plane is fitted with a regular army type adjustable pilot's seat permitting greater visibility for take-off and landing. Other features and refinements include improved fuselage lines, semi-enclosed exhaust manifold, and a new undercarriage design resulting in performance characteristics comparable with the Mailwing (PA-5). Comparative specifications are as follows:—

	PA-5 Mailwing	*PA-6 Super-Mailwing*
Wing Span	33 ft.	33 ft.
Overall-Length	21 ft. 10½ in.	22 ft. 10½ in.
Mail Capacity	21½ cu. ft.	40 cu. ft.
Gasoline Capacity	56 gal.	76 gal.
Oil Capacity	5½ gal.	7½ gal.
Wt. Empty	1742 lbs.	1840 lbs.
Engine	Wright J-5-C	Wright J-5-C

We shall be pleased to submit other specifications and performance data on request

PITCAIRN AIRCRAFT INC.

LAND TITLE BUILDING - - PHILADELPHIA

COUZINET TRANSATLANTIC PLANE

THE transatlantic monoplane Couzinet, designed by Messrs. Couzinet and Gianoli and built at the Établissements Letord in France presents in its aerodynamic features a thoroughly modern design. It is a low wing monoplane with three engines. The central engine is housed in the nose of the body while the two other engines are placed in nacelles under the wing. The nacelles also combine a "pants" type landing gear, the two wheels being housed in their well streamlined lower portions.

The plan form of the tapered cantilever wing is a combination of trapezoidal and elliptical forms and besides aerodynamic features is very efficient from a structural standpoint as regards torsion. While the aerodynamic properties of the design were probably studied in the wind tunnel, an examination of the three-view drawing reveals a few doubtful points. The sizes of all controlling surfaces seem to be unusually small, particularly the rudder. The ailerons are of "Panther" type (inset) of unusually small chord. The vertical fin area, however, seems to be ample.

The lines of the design are remarkably clean, the body and nacelles reminding one of good racing practice. The maximum L/D obtained in the wind tunnel has a value of 14.7. One of the main features of the design is the watertight body which has reasonable flotation ability in case of a forced landing on the water. The plane is made entirely of wood.

The wing is built of one piece and attaches to the fuselage by eight bolts. It is set at a fixed angle of incidence of two degrees and has a flat under camber. The chord at the root is 16¼ feet and the thickness is 2.95 feet or about 18 per cent of the chord.

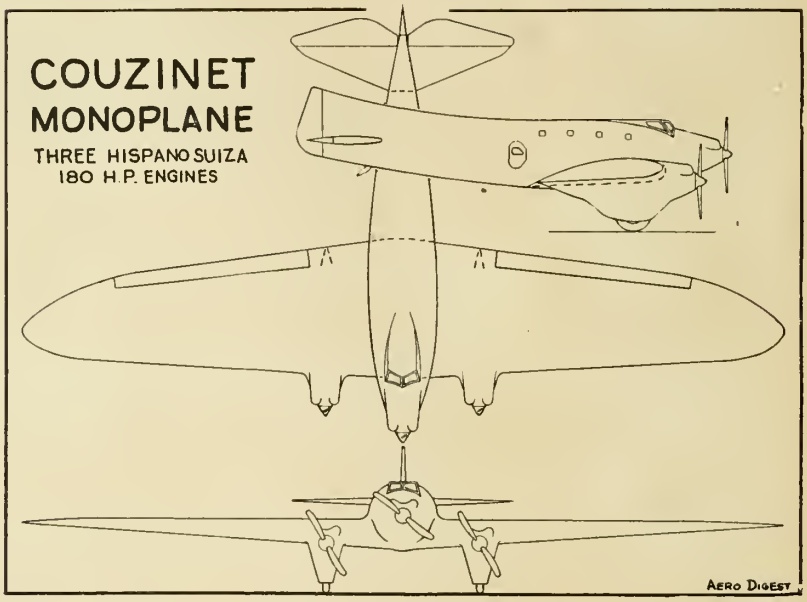
The wing structure is of standard two-beam design. The two box beams have spruce flanges and plywood webs of tapered thickness varying from .35 to .078 of an inch. The reenforcing spacers are 12 inches apart. Box ribs are spaced every 3.28 feet and the wing contour is preserved by transverse stringers. The wing is covered with plywood of thickness varying from .156 at the centre to .078 at the tips. The complete wing weighs 2.48 pounds per square foot.

The landing gear has a wide tread and consists of two wheels housed in streamlined "pants". The wheels are approximately 48 by 10 inches and the tires are of the balloon type. The shock absorber suspension consists of 36 rings of rubber shock absorber cord.

The fuselage is of monocoque construction consisting of annular diaphragms or bulkheads covered with plywood. To reenforce it there are small stringers running longitudinally. The fuselage rests on top of the wing.

The stabilizer is made of one continuous piece and the fin constitutes a part of the body proper. Surfaces are balanced by means of a "Flettner" type auxiliary surface. All controls are fully accessible in flight.

The power plant consists of three Hispano-Suiza 180-230 h.p. engines accessible in flight through a tunnel 2.3 feet in diameter. The engine cowlings are sufficiently large to allow a mechanic to work conveniently at the engine while in flight. The radiators can be retracted and the opening closed by watertight hatches. The fuel system of seven tanks is completely encased in the wing and there is no fuel in the fuselage. The fuel piping is arranged in such a way that every point is accessible in flight. A rapid dumping valve is provided for use in case of emergency; during tests 1,680 gallons of fuel were dumped in 55 seconds. Oil tanks are placed behind each engine.



The cabin for the crew is subdivided into quarters for the pilot, the navigator and the radio operator; resting quarters are also provided.

The pilot's seat is in front, behind the central engine; the mechanic's, on his right. Directly behind, there is a comfortable cot for the second pilot to rest himself on. Back of the resting quarters on the right is the radio operator and on the left, the navigator with his equipment and tables to work on. A trap door leads into the inside of the fuselage.

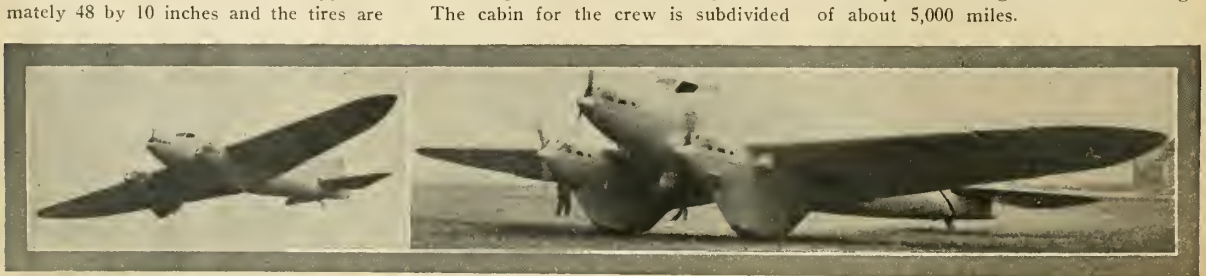
The instrument board contains a complete range of modern instruments. The pilot is provided with an ordinary magnetic compass as well as earth-inductor type compass.

The crew consists of a first pilot, second pilot, navigator, mechanic and a radio operator.

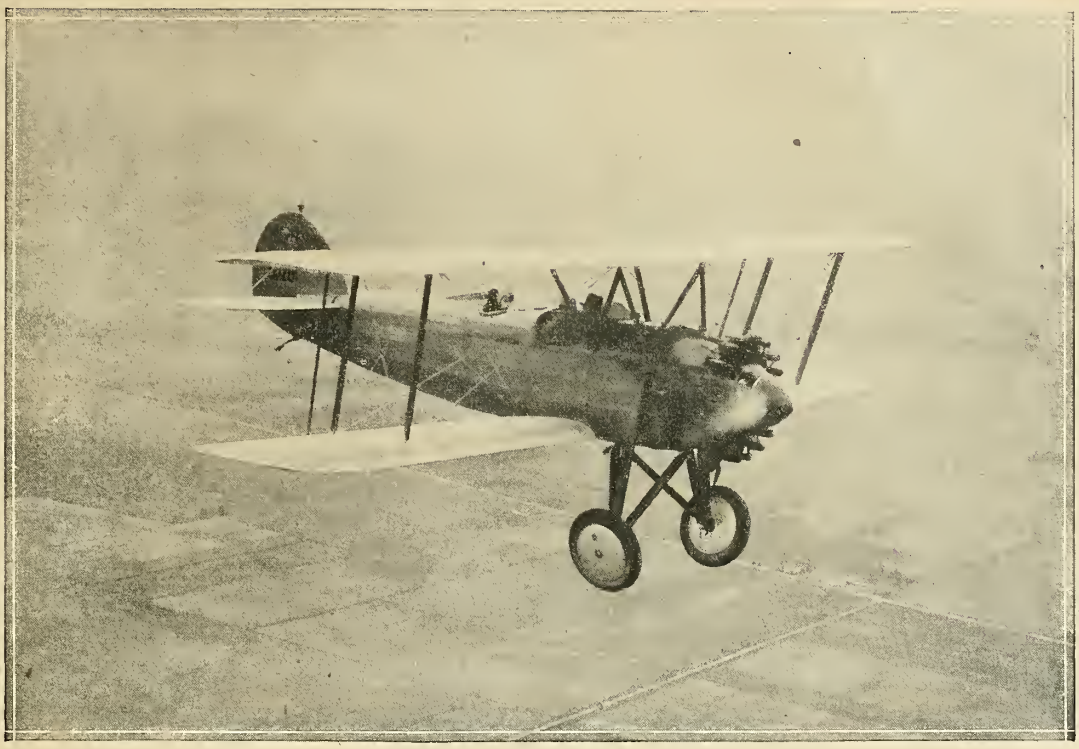
General Characteristics

Span	89 feet
Length	50.8 feet
Wing area	995 square feet
Weight empty	8,600 pounds
Useful load	11,250 pounds
Gross flying weight	19,850 pounds
Gasoline capacity	1680 gallons
Oil capacity	74 gallons
Wing loading	20 pounds per square foot
Horse-power loading	28.5 lbs. per sq. ft.

The plane is designed to have a range of about 5,000 miles.



The giant French Couzinet transatlantic monoplane in flight and with its three engines warming up on the ground.



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The Boeing two passenger training plane powered with the Caminez engine.

BOEING Design 81 is a single-bay tractor biplane, powered with the 135 horsepower Fairchild Caminez engine. It is intended primarily for sport and training purposes. Because of the fact that the engine develops full power at only 1,000 r.p.m., a relatively large diameter propeller is practical, and with the unusually high propeller efficiency thus obtained, exceptional performance is possible, particularly in climbing from a small field.

The keynote in the design of this plane has been simplicity and safety, which insures low first costs and economy in operation and up-keep.

The fuselage construction is of welded steel tubing, while the wings are of conventional wood and fabric construction. The control surfaces are of welded steel. Dual controls are provided, those in the front cockpit being readily removable. The fuel system consists of a single thirty-gallon gravity tank located in the upper wing. This requires only a single feed line, which eliminates all possibility of trouble due to gasoline pumps and piping required in other systems.

The raised axle landing gear incorporates the well-known Boeing oleo unit. Wheel brakes can be installed if desired.

The useful load of 615 pounds consists of two men and chutes, 30 gallons of gasoline and 4½ gallons of oil.

The general characteristics of the Boeing Design 81 are as follows:

Span of upper wing	35 feet
Span of lower wing	33 feet 6 inches
Overall length	25 feet
Chord of both wings	55 inches
Gap between wings	65 inches
Stagger	14 inches
Dihedral, both wings	2 degrees
Wing area	295 square feet
Propeller (four blade) diameter	8 feet 7 inches
Landing angle	15 degrees
Weight empty	1544 pounds
Useful load	615 pounds
Gross weight	2159 pounds
Wing loading	7.3 pounds per square foot
Power loading	16 pounds per horsepower

Estimated Performances

High speed	100 miles per hour
Stalling speed	45 miles per hour
Cruising speed	85 miles per hour
Endurance at cruising speed	4 hours
Service ceiling	16,000 feet

NAPIER SERIES XI ENGINE

THE latest type Napier engine, the Series XI, is a development of the Series V which has been so successful, not only with the British Royal Air Force and Imperial Airways, but with the Air Forces of many other countries.

It will be noted that the engine also embodies improvements which are a result of the experience gained with the Racing Napier Aero Engine. Among the differences in the Series XI engine is the fitting of the carburetors at the rear of the engine where they are more or less masked by the cylinders. This improves the streamlining of the engine and facilitates its installation in aircraft.

The main improvement in the engine, however, is the increase in power obtained. With a compression ratio of 6 to 1 this engine, at 2,350 r.p.m. develops 530 h.p., while its power at maximum speed, viz, 2,585 r.p.m., is 570 h.p., or 1.75 pounds per horse power.

This engine has successfully passed the Air Ministry 100 hour Type Test. This strenuous test included ten non-stop periods of 10 hours duration each at 2,350 r.p.m. at an average B.H.P. of 477. The engine was then opened up to 2,715 r.p.m. and was run for one hour at this speed. A further hour at 2,585 r.p.m. was run at full throttle, the engine developing approximately 573 B.H.P.

It was a Series XI Napier engine which was installed in the Fairey III.F. aircraft which flew from Cairo to Cape Town and back this year; the De Havilland "Hound" machine which set up three world's records was fitted with an engine of this type. The Handley Page "Harrow", Blackburn "Ripon" and Avro "Buffalo" are other types of aircraft which use the Series XI Napier.

The following is a brief specification of this latest Napier:—

Number of cylinders, twelve, arranged in three blocks of four cylinders each.

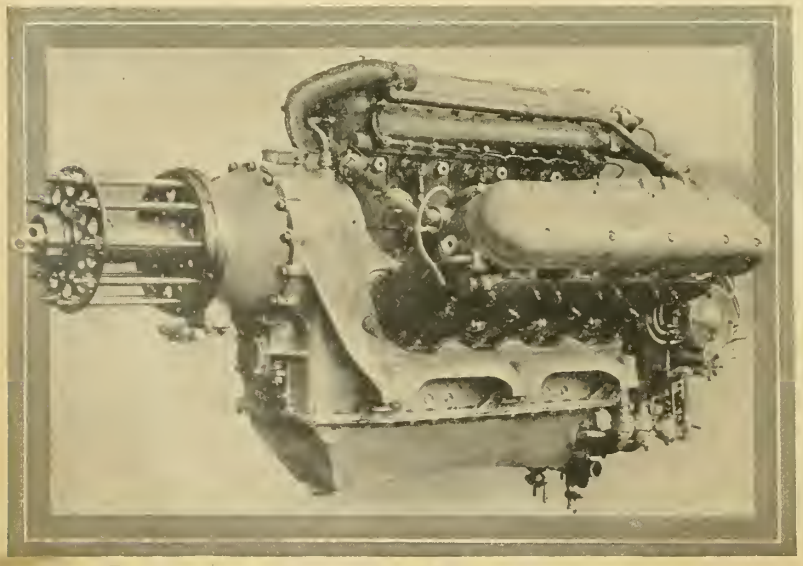
Bore, 5 ½ inches. Stroke, 5 ⅛ inches.

The normal horsepower rating is 530 B.H.P. at 2,350 revs. per minute; at maximum speed, 570 B.H.P. at 2,585 revs. per minute.

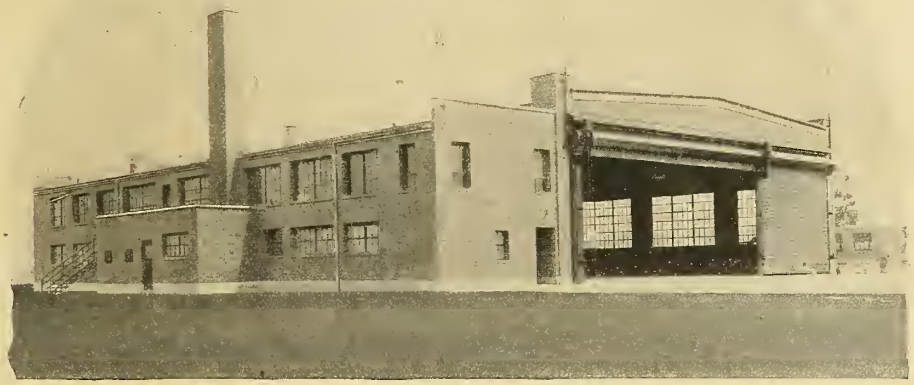
Weight of engine, approximately 995 pounds complete with airscrew boss, reduction gear, hand starting gear less magneto. Weight per horse power, on rated power, 1.879 pounds; on average power at maximum speed 1.745 pounds.

Length overall to centre of airscrew, 5 ft. 1 in.; width, 3 ft. 6 ins.; height, 3 ft. 3 ins.

Average oil consumption .0235 pound per B.H.P. per hour. Average fuel consumption, full load, .50 lb. per B.H.P. per hr.



The 530 horsepower British Napier Series XI aircraft engine.



Ohio National Guard hangar at Cleveland, recently completed by Austin

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THE FOWLER VARIABLE AREA WING

By Harlan D. Fowler, A. E.

THE principle of utilizing the chord of a wing by further extending it rearwardly, has been persistently advocated by the author for over twelve years, during which time extensive tests, designs and constructions have been made.

The present development and the results of numerous flights have more than confirmed the inventor's contention. It can now be considered beyond the experimental stage and available for practical application.

It is an economic loss to be compelled to carry along the present conventional wing surfaces when in full flight because of its most important function to permit low take-off or landing speed occupying but a few minutes compared with hours of flying. The Fowler wing is fully extended for taking off and when at a reasonable altitude it is drawn in, thus reducing air resistance and increasing the speed. For landing it is extended while flying and lands in the usual manner but with a lower angle of attack of the land plane or the seaplane.

The normal wing is constructed and braced according to recognized practice, in which the main beams and ribs form the basic structure. It is absolutely rigid. Back of the rear spar, a recess is provided on the under side of the trailing surface for the reception of a small auxiliary airfoil, which when inclosed for normal flying position presents a high speed airfoil of a perfectly smooth contour. As the auxiliary airfoil is extended rearwardly, its angle of incidence increases until a positive stop determines its true position. The final setting and shape of auxiliary airfoil is determined by the airfoil used for the normal wing. When fully extended all structural and moving parts are open to inspection. There is nothing hinged or flexible. It is rigid in its entirety although free to move in a direction parallel to the line of flight.

Resistance to controlling the movement of the auxiliary wing is due to sliding friction of the rollers and to the drag, it is not subjected to the direct lifting forces. Control forces are practically nil at the control handle when operating the auxiliary wing. The auxiliary airfoil occupies only that portion between the ailerons.

The normal wing is of conventional wood construction from the nose to the rear beam. Front and rear beams are of the box type. Fabric cover is used from the nose to the rear beam. The trailing portion is recessed on the under side to permit the auxiliary surface to fit snugly in position when closed, and is covered with plywood top and bottom. The auxiliary surface has one solid spruce beam, and is covered with plywood. Three solid duralumin supports are secured to the rear beam at the strut joints. A trolley composed of three steel rollers, one on top and two on the lower side slides freely over the duralumin supports. The trolleys are secured to the single beam of the auxiliary wing. The controls are continuous cables and lead to the control drum inside the wing, and directly over the operator's cockpit. Four complete turns of the handle moves the auxiliary wing positively, slowly, and easily through the entire flying range. The location of this control unit can be extended to the pilot's cockpit. The usual ailerons are provided. Complete static tests of the auxiliary wing supports, main trailing surface and internal cross bracing were made prior to starting construction, and all gave load factors far exceeding the requirements for the main wing structure.

With the auxiliary wing in extended position the properties of the normal wing of ordinary characteristics were increased to a maximum Ky of .00579 at 14° for the normal wing chord. Its L/D is 14.8. The model provided for full aileron control surfaces. The increased area is about 25 per cent. Based on the normal area the lift is increased about 100 per cent.

One of the most important features of this wing is the effectiveness of ailerons' control beyond the stalling angle with the auxiliary wing extended. Under extreme circumstances such as engine failure occurring shortly after leaving the ground the extended wing presents an unusual solution to this problem. The stalling angle of the wing extended is about 14°. The stalling angle of the normal wing is over 17°. Since the ailerons are a part of the normal chord the range of maximum aileron effectiveness is from 3° to 4° above the stall angle of the extended wing which should be sufficient to prevent the initial turning tendency. This is an inherent feature obtained without further structural complication.

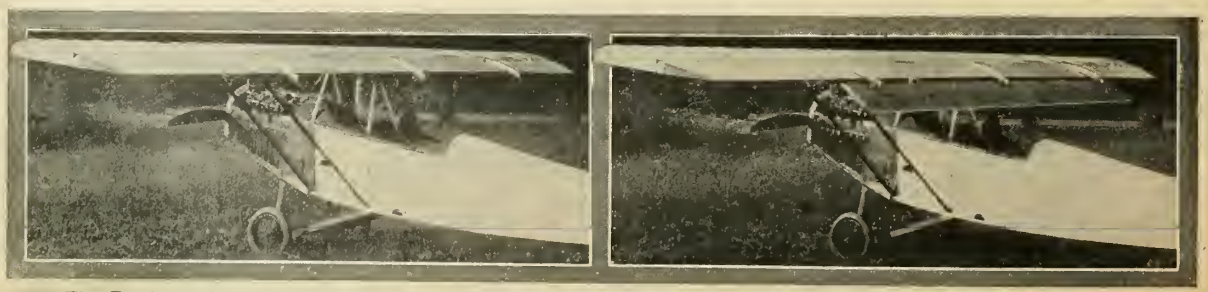
The wing was designed for a VE-7 airplane of 2200 pounds gross weight and a load factor of 8. As a VE-7 was not available a Canuck was used. The Fowler wing was 30 pounds lighter than the original wings which weighed 405 pounds and had a load factor of about 5.5. The total gross weight was 1910 pounds. A wing properly designed for the Canuck, or similar light plane, would have resulted in a saving of at least 100 pounds. Original wing area 353 square feet; Fowler wing, normal, 136 square feet; extended, 166 square feet.

With a full load the Canuck with this new wing took off in 9 seconds in practically still air and stopped in 10 seconds. Its take off speed was almost identical and when timed over a measured course gave 94 m. p. h. as compared with 74 m. p. h. for the original Canuck. And this in spite of improper propeller, no streamlining, and a faulty engine. These ordinary refinements should improve the speed to at least 100 m. p. h. Rate of climb was about 260 feet per minute and increased as the auxiliary surface was retracted. No adjustment was made to the stabilizer, and *it was found to be possible to fly hands off with the auxiliary wing fully extended or wholly inclosed.* Lateral control appeared to be as effective as any good conventional ailerons would be. The above data are the results of numerous trials.

The importance of the wing to the present day airplane is its ability to carry greatly increased pay load. It is possible to double the pay load for a conventional airplane for about the same performance which will reduce the cost per pound to one-half. It will enable doubling the gasoline capacity and the speed range which improves the possibility of extremely long flights and long endurance tests.

The wing will also permit an airplane to be designed which will perform equally as well as a larger plane of 30 per cent more power, i.e., a plane of 150 h.p. with this wing could be made to perform as well as a plane of 200 h.p. of the same flying range and pay load.

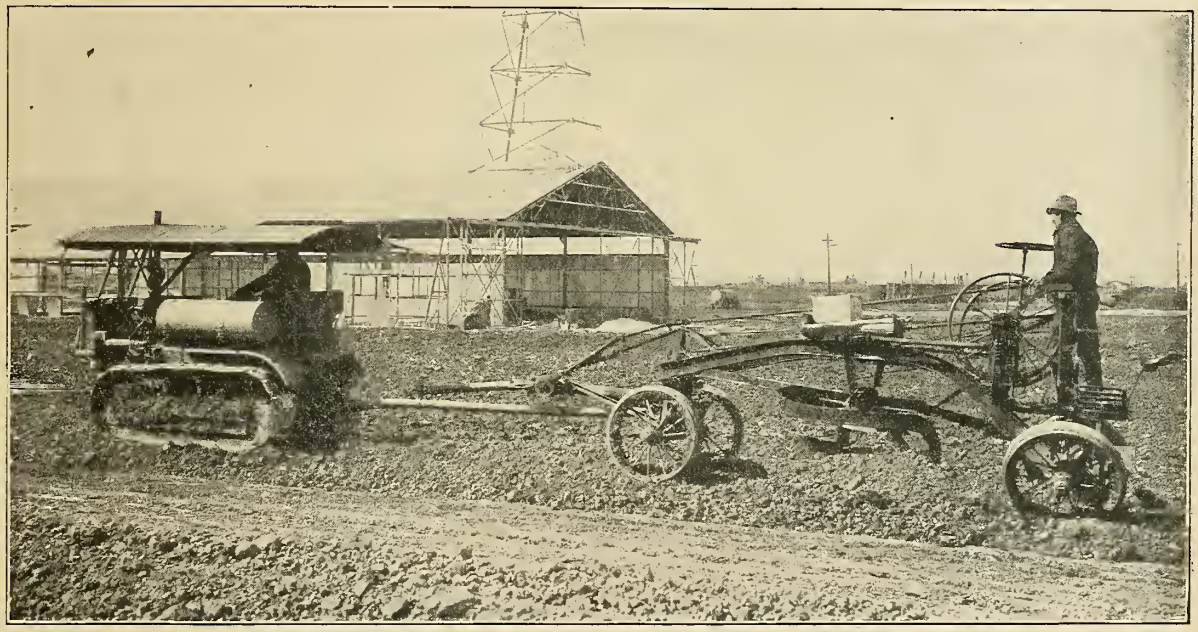
Its adaptability to the solution of varied and difficult performance required for exceptional purposes is especially valuable. It can be substituted in place of the original wings of most planes with very few alterations and greatly improves visibility when replacing a biplane cellule.



The Fowler variable wing area installed on a Curtiss JN, showing the surface in extended and retracted positions.

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DORNIER DOLPHIN FLYING BOAT

THE Dornier Dolphin III flying boat constructed by the Dornier Metallbauten G.m.b.H. of Friedrichshafen, Germany, is an all metal transport monoplane with externally braced wings. The wing consists of two panels joined above the body and supported in semi-cantilever fashion by a pair of sloping struts at each side of the hull.

The wing is of two beam construction made of drawn built up steel sections. The wing contour is obtained by means of box ribs covered with sheet duralumin.

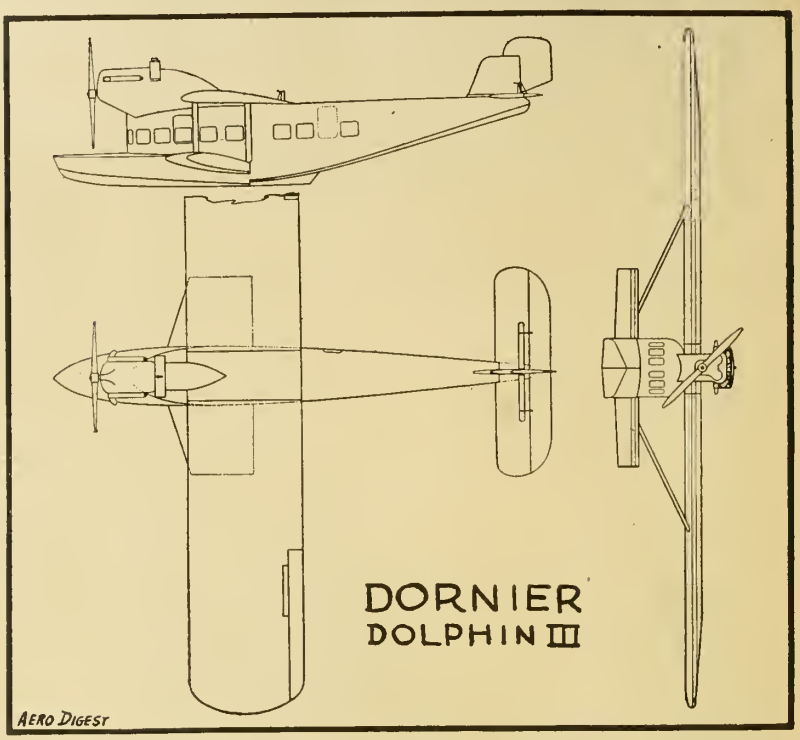
The hull has a slight Vee bottom and a long bow protruding in front of the propeller. Lateral stability is provided by sponsons on each side. The pilot's compartment is all enclosed and provided with dual controls. In addition to the pilot and one mechanic, the passengers' cabin provides comfortable accommodations for ten persons.

The tail surfaces are supported from the stern of the hull and controlling surfaces are balanced, the stabilizer being balanced by means of auxiliary surfaces while the rudder is balanced by a surface area ahead of the hinge.

In the hull the material used in the construction of the frame is duralumin with a few steel reenforcements. The structure of the hull is built up with transverse bulkheads of duralumin connected with longitudinal stringers.

The stabilizer has steel beams, sheet duralumin ribs and duralumin covering; the elevators have duralumin ribs and fabric covering; the fin and rudder have duralumin ribs and duralumin coverings.

The power plant consists of a single engine installation in a nacelle on top of the wing and pilot's compartment. Engine cowls are removable for rapid accessibility. The engine is a 450-600 h.p. water cooled type B. M. W. VI with a radiator mounted above it. The propeller is a D. M. B. two-bladed wooden type, driven directly in tractor position.



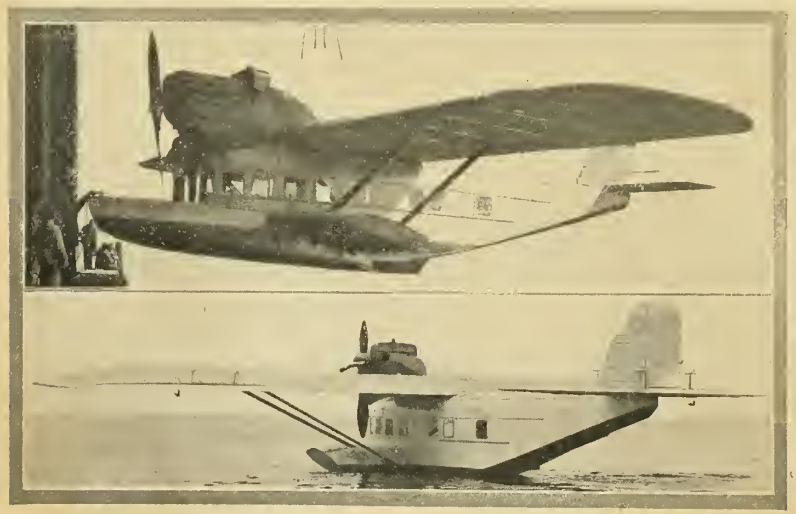


The Dornier Dolphin III taking off. It has a high speed of 118 miles per hour.

The two main fuel tanks are located in the root of the wing. A single oil tank is located behind the engine.

General Data—Dornier Dolphin III

Span overall	64 feet
Length overall	47 feet
Height overall	12 feet 10 inches
Wing area	665 square feet
Weight empty	5,290 pounds
Gross flying weight, normal	8,160 pounds
Gross flying weight, maximum	8,820 pounds
Cruising speed	92.5 miles per hour
High speed	118 miles per hour
Fuel consumption	1.97 pounds per mile



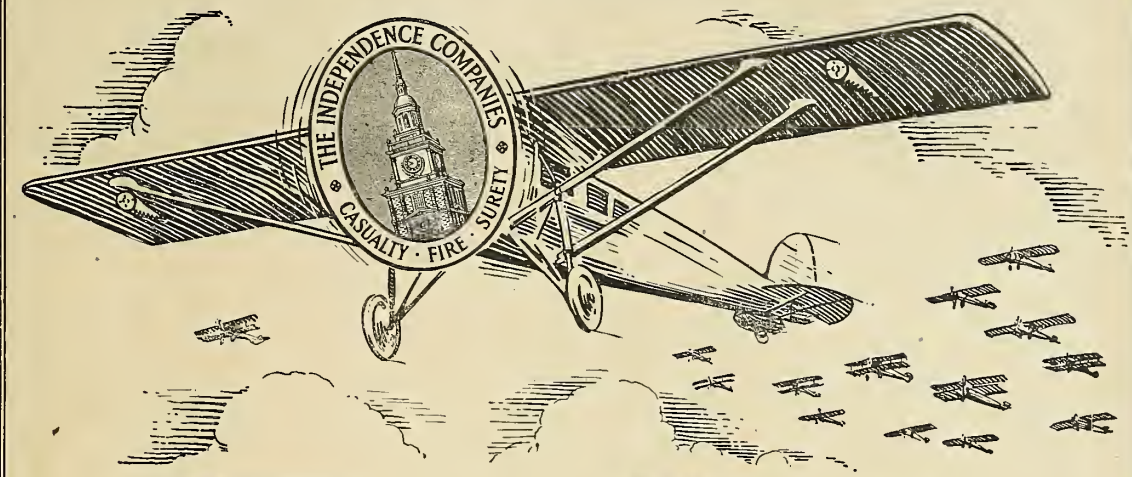
The Dornier Dolphin III all metal sesqui-wing tractor flying boat.

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IMPROVEMENT in performance, life and appearance of aircraft instruments is expected from the introduction of Bakelite molded cases. Although some instruments are already made of non-corrosive materials exclusively, yet, unless proper care is exercised in the design and assembly, contact between aluminum and brass parts results in electrolitic action, affecting the performance and durability of the instruments.

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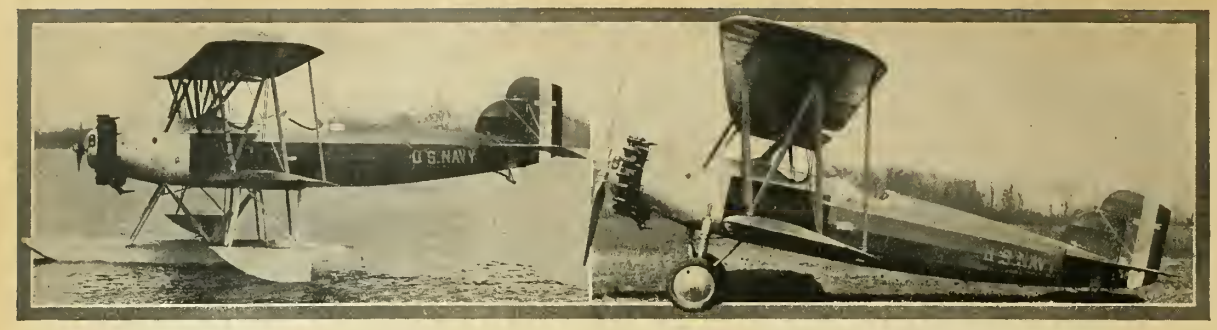
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The Keystone "Pup", type XNK-1, primary military training plane equipped as a seaplane or a land plane.

KEYSTONE PRIMARY TRAINING AIRPLANE

ONE of the latest additions to the Keystone family is the Navy training plane, known as the Keystone "Pup", and officially designated as the XNK-1, built by the Keystone Aircraft Corporation of Bristol, Pa. The primary training plane, "Pup", is a two seater tractor biplane, convertible land and seaplane for instruction in fixed and flexible gunnery, bombing and spotting. It is powered with the Wright J-5 "Whirlwind" fitted with a Standard Steel propeller.

The "Pup" has been designed to embody the features of unusual visibility from all angles, maneuverability at stalling speeds, together with the rugged construction to withstand hard service use. The fuselage is constructed of chrome-molybdenum steel tubing, welded in a truss with no wires.

The USA-35-B wing curve is used. The ribs are of semi-truss type. Tail surfaces of welded steel construction are fabric covered. The tail skid is steerable. The starting system of the Wright J-5A is of the hand-inertia type with a booster magneto. The fuel system consists of two tanks in the upper center section, fitted with standard fuel gauges and having a total capacity of 40 gallons of gasoline.

The "Pup" is equipped with a pressure fire extinguisher and the cockpits are provided with all the usual instruments for military flying. Control is by stick and rudder pedals and the stabilizer is adjustable in flight. The plane is provided with installations for radio. One fixed machine gun may be mounted in the fuselage, firing through the propeller and operated by the triggers on the control stick. The rear cockpit is also equipped for the installation of a flexible machine gun. Bomb racks for light bombing may be installed as an additional feature.

The gross weight as a land plane is 2,522 pounds, and the gross weight as a seaplane is 2,770 pounds.

Specifications

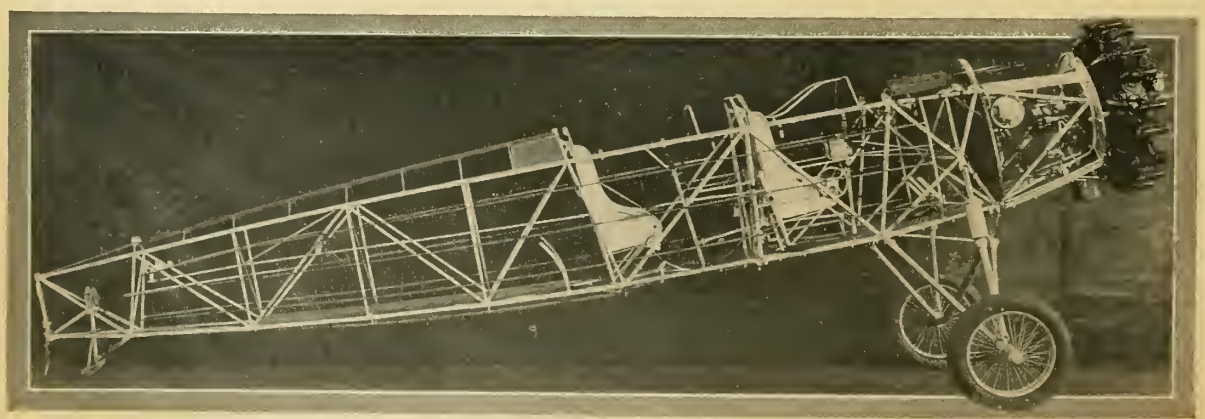
Span, upper wing	37 feet
Span, lower wing	32 feet 4 inches
Height, land plane	10 feet 7½ inches
Height, seaplane	12 feet 1½ inches
Length, land plane	26 feet 5½ inches
Length, seaplane	28 feet 7½ inches
Gap	5 feet 10 inches
Stagger	15 inches
Dihedral (both wings)	2 degrees
Chord (both wings)	60 inches
Incidence (both wings)	0 degrees
Span of tail plane	11 feet 2 inches
Wings	325 square feet
Ailerons	34.7 square feet
Stabilizer	19 square feet
Elevators	16.2 square feet
Fin	3.3 square feet
Rudder	10.5 square feet
Maximum speed	116 miles per hour
Minimum speed	45 miles per hour
Climb in 10 minutes	8,500 feet
Service ceiling	16,000 feet
Endurance at full speed	2.2 hours
Endurance at cruising speed	4.2 hours
Range at full speed	250 miles
Range at cruising speed	375 miles

WRIGHT "CYCLONES" FOR COMMERCIAL USE

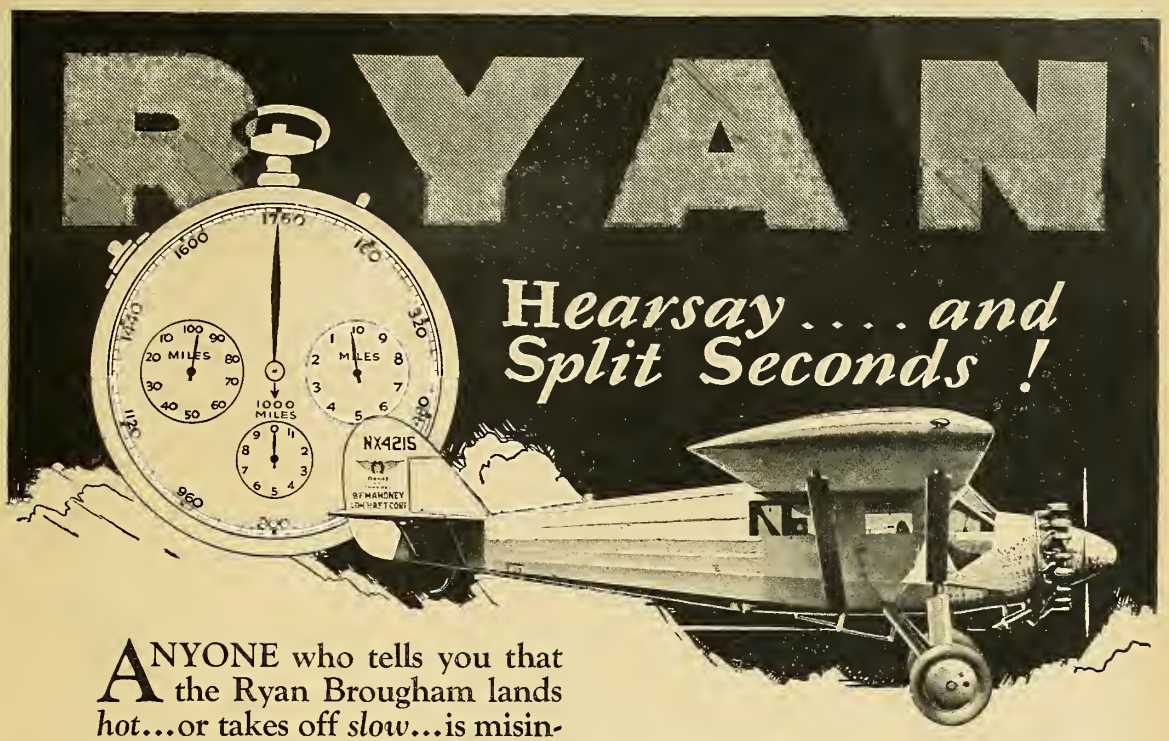
THE Wright "Cyclone" 9-cylinder 525 h.p. air-cooled engine is now ready for commercial production.

Up until the present time the supply of these new type heavy duty power plants has been absorbed by the U. S. Navy which fostered, encouraged and advised its development. One of the first "Cyclones" to be built under government contract has completed hundreds of hours of running on test stands. Others of this latest type have been flown extensively in six different types of airplanes among them being the Wright XO-3 observation plane, the newest Keystone Army XLB-6 "Panther" bombing planes, the record breaking Navy PN-12 flying boat and other government ships.

In its first official test at Philadelphia on April 5th two "Cyclones," with which the new type Navy PN-12 flying boat is equipped, aided in breaking the world's seaplane endurance record by remaining in the air over 36 hours. Later the same plane established three additional records: one for continuous flight with a useful load of 1,000 kilograms for more than 11 hours, the second a distance record of 1,247 miles with this heavy weight and the third an altitude record of 16,700 feet with the same load of 1,000 kilograms.



Skeleton framework of the Keystone "Pup" fuselage showing general arrangement and details of its construction.



ANYONE who tells you that the Ryan Brougham lands *hot*...or takes off *slow*...is misinformed or doesn't know his stop watch! Below are the Official Qualifying figures for the 1928 National Air Tour, which include two 1928 Ryan Broughams and the five Whirlwind cabin plane competitors:

	*Landing time in seconds	*Take-off time in seconds	Number of seats	Price of plane
Ryan No. 10	4.52	9.94	5	$12,200
Ryan No. 16	5.09	11.41	5	12,200
Monoplane	5.68	13.52	5	13,950
Monoplane	7.20	16.20	5	12,500
Bi-plane	7.94	12.80	5	12,500
Monoplane	9.12	11.91	5	13,500
Monoplane	9.20	14.80	6	14,500
Monoplane	9.60	14.39	5	12,500
Monoplane	14.17	14.84	6	14,500

The Ryan Brougham *takes off* faster and *lands* slower

with its full load than any other five or six-place Whirlwind cabin plane on the market . . . a most important factor of safety with today's fields. Furthermore, it is the only Whirlwind cabin monoplane in the world with a service ceiling of over 16,000 feet.

The Mahoney-Ryan Aircraft Corporation builds *and sells* more Whirlwind cabin monoplanes than any other manufacturer. Quality construction and performance are the two big reasons for this leadership. Quantity production makes possible the price, $12,200, fully equipped at the factory.

DISTRIBUTORS

MASSACHUSETTS AIRWAYS CORP'N, *Springfield, Mass.*
CAPITOL AIRWAYS, Inc. . . . *Washington, D. C.*
MAYER AIRCRAFT CORP'N . . . *Bridgeville, Pa.*
BUFFALO AIRCRAFT DISTRIBUTORS *Buffalo, N. Y.*
MENEFEE AIRWAYS, Inc. . . *New Orleans, La.*
KNAPP FLYING SERVICE . . . *Ypsilanti, Mich.*
MIDWEST AIRWAYS, Inc. . . *Milwaukee, Wis.*
NORTHROP AEROPLANE CO. . *Minneapolis, Minn.*
MIDWEST AIRWAYS CORP'N . . *Monmouth, Ill.*
BEACON AIRWAYS OF AMERICA, Inc. *Kansas City, Mo.*
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STRANSKY AIRLINES, Inc. . . *Pukawana, S. Dakota*
SOUTHWEST RYAN AIRLINES, Inc. *Tulsa, Oklahoma*
SCENIC AIRWAYS, Inc. *Phoenix & Grand Canyon, Ariz.*
MISSION AIRPLANE SERVICES . *San Antonio, Texas*
THOMPSON FLYING SERVICE *Salt Lake City, Utah*
MUTUAL AIRCRAFT CORP'N . *Los Angeles, Calif.*
RANKIN FLYING SERVICE . . *Portland, Oregon*
M. A. ZUNIGA . . . . . *Central America*
COUNT G. BONMARTINI . . . *Rome, Italy*

The valuable Mahoney-Ryan franchise is available only to operators and qualified business executives

Ryan Brougham—U. S. Dept. of Commerce Approved Type Certificate No. 25

The MAHONEY — RYAN AIRCRAFT CORP'N

Owners of Ryan Air Lines *San Diego, Cal.* and Ryan Flying Company *St. Louis, Mo.*

* These figures are not guaranteed, but were compiled from sources which we believe to be reliable.

WESTERN NEWS

CALIFORNIA AIR NEWS

ESTABLISHMENT of night flying, both for students and passengers, was put into effect the evening of July 11 at the Ryan airport, San Diego, by the T. C. Ryan Flying Service school, to commemorate the arrival of the planes in the National Air Tour. Night flying will now be carried out every night in the year, holidays and Sundays included.

The Ryan flying field has been fitted with flood and landing lights and the planes with parachute flares and every modern aid for night flying. Four large loud speakers, equipped with amplifiers, have been installed at the Ryan flying school and lectures on aviation, interspersed with musical programs, are given daily.

THE first combined parlor car and parlor plane tour, as far as records show, has been arranged to bring several extra thousand tourists to the air route over California during the immediate summer season.

Maddux Air Lines, operators of the Ford three-motored, all-metal monoplane in daily passenger service between Los Angeles, Bakersfield, Fresno, Oakland and San Francisco, and the California Parlor Car Tours, through a large number of agents in all eastern cities, will sell round trips between Los Angeles and San Francisco, one way land, one way air.

One way, the trip will require three days, with stops at the finest hotels for meals and rooms, a de luxe service for extra fare passengers. The return will be made in four hours on the air route, "summing up" the grandeur of California after seeing it in detail.

T. C. RYAN, president of the Ryan Aeronautical Corporation, licensees and exclusive distributors in the United States for Siemens-Halske engines, has just returned to San Diego from an extensive tour of Germany, England and France.

In addition to distributing Ryan-Siemens engines to the aircraft industry of the United States, Ryan also operates at San Diego a flying school and airport.

OFFICIALS of the air ministries of England, France and Germany, and the Prince of Wales, have given unstinted praise to the reliability and efficiency of the Russell lobe parachute, a strictly American product, according to H. R. McClintock, president of the Russell Parachute Company of San Diego.

Mr. McClintock has just returned to San Diego from an extensive tour abroad during which, with the aid of John Tranum, noted Danish parachute jumper, he demonstrated the superiority of the lobe parachute over those in use in Europe.

The Italian and Spanish governments are interested in the Russell parachute and Tranum will make a number of demonstrations in those countries before going to Sweden, Denmark, where he will conclude his European Tour.

AFTER months of careful preparation Pacific Technical University, San Diego, is ready to offer a comprehensive home study course in airplane drafting. This progressive institution is among the first to provide such a course of instruction.

DR. CLARENCE POTTER has been appointed official flight surgeon at Mills Field, San Francisco's municipal airport. He will examine all applicants for licenses as pilots and supervise the hospital department at Mills Field.

A REMARKABLE RECORD

By Charles V. Eakin

AS president of the Union Air Lines, running on regular schedule between Portland, Oregon, and Seattle, Washington, and between Portland and San Francisco, Calif., we believe that the following will be of interest, not only to airline operators, but to everyone connected with the aviation industry.

From March 5th to June 30th, the toughest season of the year for flying in rain and snow over the mountains of the northwest, two Bach Air Yachts flew 125,000 air miles in 1150 flying hours, carrying 2,906 paid passengers between Seattle and San Francisco. We believe this constitutes a record unequaled anywhere in the world, over the same length of time.

Also of interest is the fact that the Pratt and Whitney Wasp engines ran without overhaul 540 hours. Not a forced landing during that time and not one engine has quit in the air.

SACRAMENTO AIR NEWS

By Ralph K. Clark

SACRAMENTO was made the first stop on an aerial good-will tour of 33 states when Martin Jensen, winner of second place in the Dole flight, arrived here during July in his plane *Aloha*.

The trip over the United States will include the principal cities and is expected to last about nine months. The object of the tour is the development of interest in aeronautics.

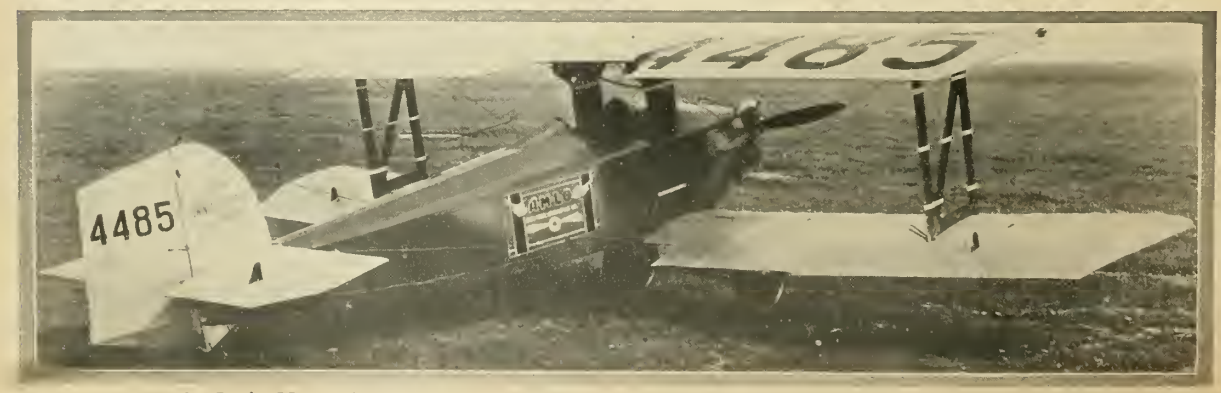
Accompanying Jensen are Mrs. Jensen, Fred Bowerman, Jr., and C. M. Schoening, sponsor of the flight.

A TOTAL of $8,258 worth of aeronautical equipment has been received by the Galt, California, High School as the first installment of airplane supplies which the United States Army and Navy have promised it. The endowment is being made to the school in honor of it being the first institution of its kind to incorporate an aviation course in its regular curriculum.

THE eighth observation squadron of the United States Marine Corps, officially known as VO Squadron 8-M, from the naval air base at San Diego, arrived at Mather Field here last week for its summer practice maneuvers.

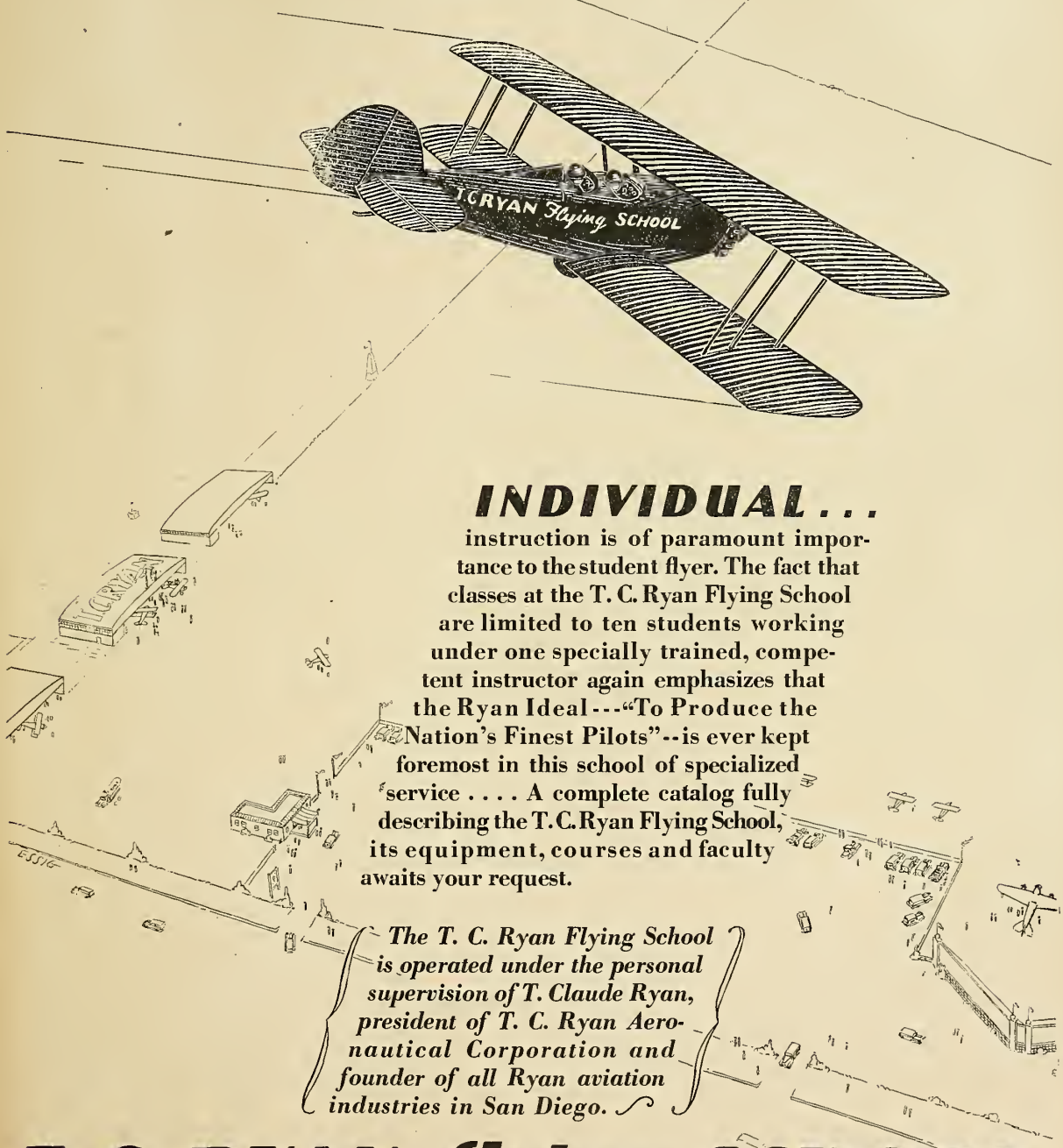
One hundred and twenty-five men and officers came by plane and train, and will be stationed here until late in September. The squadron's fighting equipment consists of eight of the new Curtiss Falcon planes, two Douglas observation planes, and one Boeing training plane.

Preliminary, as well as advanced training will be given.



The Irwin Meteorplane used by the Texas Pacific Coal and Oil Company, Fort Worth, Texas.

The T. C. Ryan Flying School Offers All the Advantages of San Diego . . .
"Air Capital of the West."



INDIVIDUAL . . .

instruction is of paramount importance to the student flyer. The fact that classes at the T. C. Ryan Flying School are limited to ten students working under one specially trained, competent instructor again emphasizes that the Ryan Ideal---"To Produce the Nation's Finest Pilots"--is ever kept foremost in this school of specialized service . . . . A complete catalog fully describing the T. C. Ryan Flying School, its equipment, courses and faculty awaits your request.

The T. C. Ryan Flying School is operated under the personal supervision of T. Claude Ryan, president of T. C. Ryan Aeronautical Corporation and founder of all Ryan aviation industries in San Diego.

T. C. RYAN *flying* SCHOOL

Affiliated with Pacific Technical University . . . . San Diego, California

I am interested in your course of Flying Instruction. Please forward your catalog.

NAME_____ ADDRESS_____

A. D.-8.

THE 1928 NATIONAL AIR RACES AND AERONAUTICAL EXPOSITION

INCREASE in prize money and trophies bringing the total value of awards in excess of $200,000 has been announced by the executive committee of the National Air Races and Aeronautical Exposition, scheduled for September 8 to 16, inclusive, in Los Angeles.

The California Air Race Association, sponsor of the meet, under sanction from the National Aeronautic Association, has offered $125,000 in cash prizes. The 17 control cities, through which contesting pilots in the New York to Los Angeles air derbies will fly, have materially added to this figure with substantial cash lap prizes and valuable trophies. The balance of the prize money is made up of cash awards and trophies put up by individuals and business firms interested in the advancement of aviation.

Miss Elizabeth C. P. Miller, aviation enthusiastist of Cleveland, O., has offered $5,000 in cash and a silver trophy from Tiffany's as special awards for the transcontinental air races, which places her at the top of the individual donors.

The 17 control cities to offer coöperation and prize awards for the New York to Los Angeles races are Harrisburg, Pa.; McKeesport, Pa.; Columbus, O.; Terre Haute, Ind.; St. Louis, Mo.; Kansas City, Mo.; Wichita, Kan.; Oklahoma City, Okla.; Fort Worth, Abiline, Midland, Pecos and El Paso, Texas; Lordsburg, N. M.; Tucson and Yuma, Arizona; and the finish, Los Angeles, California.

The prize list is practically evenly divided between the transcontinental, Pan-American, Canadian and California state derbies, and

Mines Field, Los Angeles September 8-16

the program of closed-course races and special events to feature the nine-day meet.

Six transcontinental air derbies, to terminate at Mines Field during the nine-day meet will feature the expansive program of events planned. Heading this group is a New York to Los Angeles free-for-all nonstop race for prizes aggregating $22,500 in cash and other valuable trophies.

Civilians only will be eligible to compete in three other New York to Los Angeles hops, for class A, B and C planes. Cash prizes of $40,000 and other trophies will go to the winners of these events, which are to be elapsed time contests, with stops to be made at designated control cities.

From Windsor, Canada, an international air derby, open to Canadians only, is to be conducted for $10,000 in cash and trophies. A Pan-American derby, from Mexico City, will be open to contestants of the Pan-American countries, for stakes aggregating $10,000 and trophies.

From San Francisco there will be a race for class A ships to Los Angeles and from Oakland to Los Angeles for class B ships, with cash awards of $2,000 and $3,000 respectively.

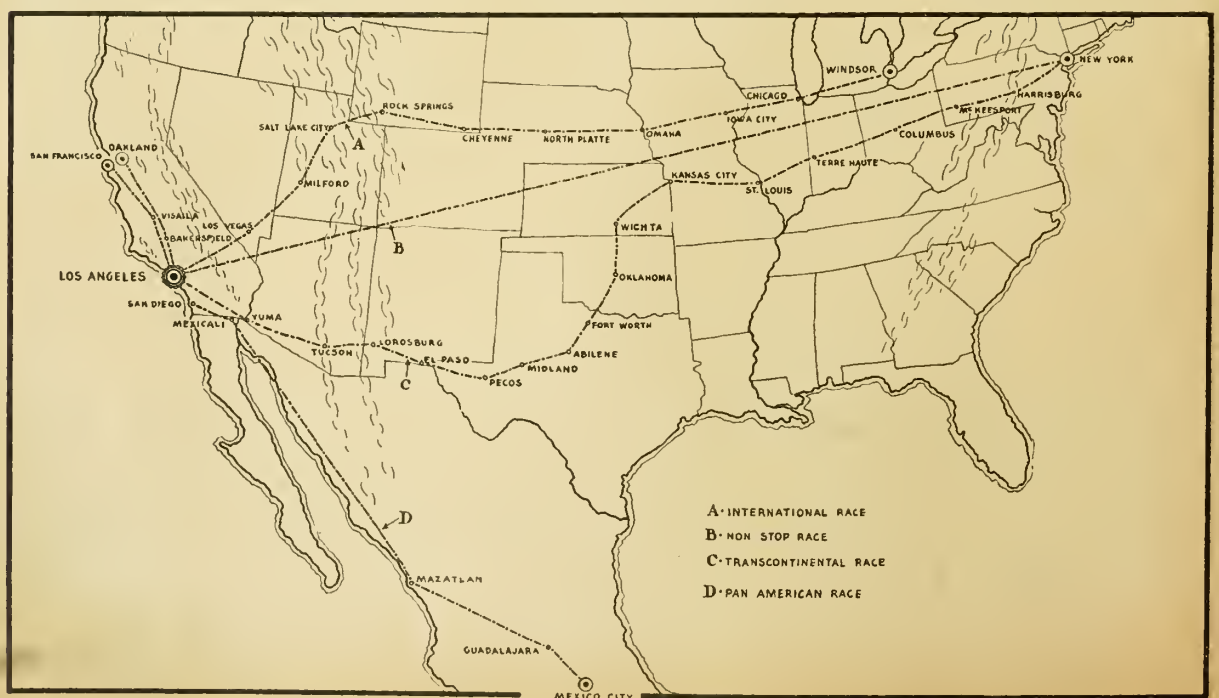
There will be the following special events: breaking the world's airline distance record and breaking world's endurance record, with $5,000 in cash and trophies for each event; an airplane model building contest for California boys and girls, and an airplane model flying contest open to any boy or girl, with $750 cash prizes and trophies each.

The regular events, all of which have substantial cash awards and trophies, include: a relay race for OX5 engined planes; free-for-all open to all type ships powered with motors of 510 cu. in. displacement or less; free-for-all for all type ships powered with motors of 720 cu. in. displacement or less; free-for-all open to all type of open cockpit ships powered with motors of 800 cu. in. displacement or less, carrying total load of 340 lbs.; free-for-all speed and efficiency race open to all type cabin planes powered with motors of 800 cu. in. displacement or less; free-for-all open to all type cabin planes, carrying minimum contest load of 1,000 lbs. at a minimum speed of 80 m.p.h.; a parachute jumping contest open only to members of Army, Navy and Marine services; Navy pursuit plane race; Army pursuit plane race; National guard race; a free-for-all military pursuit planes; special race for National guard, Army and Navy reserve pilots flying PT training type planes; and a light airplane speed and efficiency contest open to all type ships powered with motors of 300 cu. in. displacement or less.

The following firms and individuals are among the many who already have promised special trophies; A-C Spark Plug Co., AERO DIGEST, Douglas Company, Western Flying, and Sid Grauman.

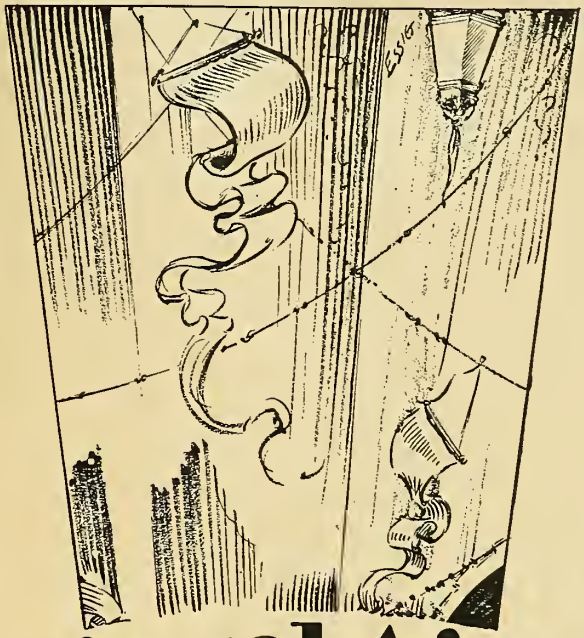
Plans for the exposition building, now under construction, have been altered to make available an additional 40,000 square feet of floor space necessitated by a heavy influx of reservations. The building origi-

(*Continued on next page*)

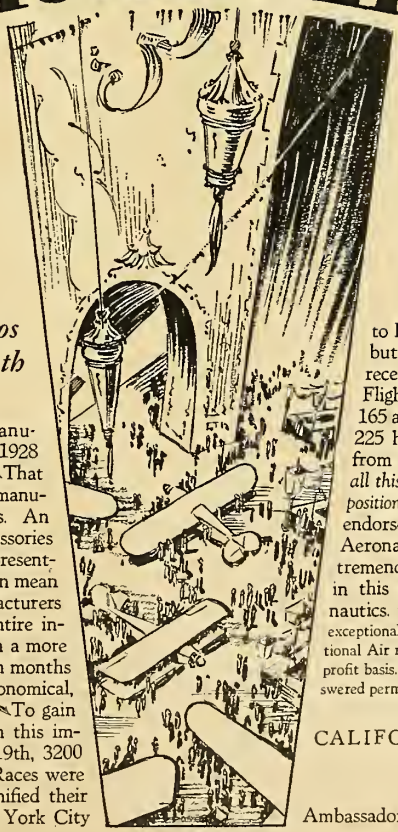


Routes and control stops of the air derbies to Mines Field, Los Angeles

ANOTHER IMPORTANT MESSAGE TO AIRCRAFT AND ACCESSORY MANUFACTURERS



1928 National Air Races



and Aeronautical Exposition, Los Angeles—September 8th to 16th

Every important manufacturer of aircraft in America will attend the 1928 National Air Races and *Aeronautical Exposition!* That paragraph speaks volumes to the wide-awake manufacturer of aircraft and airplane accessories. An opportunity to display and demonstrate accessories before such a complete gathering of *key* men—representing the real buying power—of the air industry can mean but one thing—increased sales volume! Manufacturers of such accessories will be able to cover the entire industry during the nine days of this exposition in a more thorough manner than would ever be possible in months of traveling. It represents the most efficient, economical, and modern method of *selling* your production. To gain a mental picture of the wide-spread interest in this important event, weigh these facts—up to July 19th, 3200 applications for entry blanks in the 1928 Air Races were received. Of this huge total 165 applicants signified their desire to enter the Non-stop Flight from New York City to Los Angeles, and contrast this with the fact that but 13 such applications and only two entries were received for this event in 1927! The Pan American Flight, from Mexico City to Los Angeles has brought 165 applications for entry blanks in this event, while 225 have been received for the International Flight from Windsor, Canada to Los Angeles. *In addition to all this 165 applications for space in the Aeronautical Exposition had been received up to that date!* Such hearty endorsement of the 1928 National Air Races and Aeronautical Exposition serves only to indicate the tremendous interest manufacturers and pilots alike have in this epochal episode in the development of aeronautics. Space in the Aeronautical Exposition is still available at exceptionally reasonable rates—it is to be remembered that the National Air races and Aeronautical Exposition is conducted on a non-profit basis. Your inquiry requesting information will be promptly answered permitting you ample time to arrange your exhibit. Write or wire

CALIFORNIA AIR RACE ASSOCIATION
CLIFF HENDERSON,
Managing Director
Ambassador Hotel Los Angeles

(National Air Races continued)

nally was to have been 400 feet by 400 feet. One of the dimensions has been increased to 500 feet, giving a total floor space of 200,000 square feet.

Among the firms to already reserve space are Westinghouse, Wright Aernonautical, Eclipse Manufacturing Co., A. G. Spaulding, Irving Airchute Co., Cleveland Pneumatic Tool Co., Gordon and Ferguson Co., Timken Roller Bearing Co., Douglas Co., Associated Oil Co., Richfield Oil Co., Standard Oil Co., Union Oil Co., Shell Oil Co., Texaco Oil Co., Advance, Fairchild, Curtiss-Robertson, Federal Aircraft, Lockheed, Kinner and AERO DIGEST.

Space will also be provided for certain industrial exhibits foreign to the aeronautical field, following the urgent requests of several manufacturers that a place be made for them in the picture.

HONOLULU AIR NEWS

By VERNE HINKLEY

THE flight of the *Southern Cross*, Capt. Charles Kingsford-Smith's Fokker monoplane, from Oakland, Calif., to Melbourne, Australia, is now historic. As news this argosy of the air has been forgotten by the millions who read of it early in June. But the resident of Honolulu, particularly those who came in contact with the four men who made up the crew of the ship, will long remember the courageous group who landed at Wheeler Field the morning of June 1 and took off the next afternoon for the island of Kauai.

Tired as they were from their 27-hour hop from Oakland, Captain Kingsford-Smith, Capt. C. T. P. Ulm, the organizer and manager of the flight, Capt. Harry Lyon, the navigator, and James Warner, the radioman, showed no sign of anything but determination and bulldog grit as they faced the 3180-mile jump from Kauai to Suva.

The confidence with which the two Australian members of the cruise faced the remainder of the trip, once they had reached Hawaii, is best illustrated by a wager between Captains Kingsford-Smith and Ulm. As the gasoline was being drained from the plane's tanks at Wheeler Field speculation was rife as to the amount left. Kingsford-Smith was sure there couldn't be more than 130 gallons. Ulm contended that the amount would be closer to 200. As a consequence Smith wagered Ulm champagne and cigars at the Grand Pacific hotel in Suva, that he was right. When the check was completed 194 gallons had been drawn off. We assume that both men enjoyed the fruits of their wager at Fiji.

A feature of the take-off at the Barking Sands, Kauai, was the presence on the field of three monoplanes which had crossed the Pacific from Oakland. The *Southern Cross* was the most recent addition to that family, the other two members being the Army Fokker, flown here by Maitland and Hegenberger, and Martin Jensen's *Aloha*, winner of second place in the Dole Derby of 1927.

Art Goebel, Dole winner, was in Honolulu to greet the men of the *Southern Cross* as was Capt. Lowell Smith, leader of the Army's round the world flight.

IMPRESSIVE Memorial Day services were held here honoring the memory of airmen who have lost their lives in the Pacific. Both Goebel and Jensen, flying in the *Aloha*, dropped wreaths on the sea a few miles south of Honolulu as a tribute to those who were lost in the Dole race.

LIEUT. OAKLEY G. KELLY, who, in company with Lieut. John A. Macready, was first to make a non-stop flight across the American continent in May, 1923, was a caller at Honolulu June 14 for a day en route to his new station at Manila.

AERIAL news of Hawaii was climaxed this month with the arrival of Captain Harry Lyon and James Warner, navigator and radioman for Captain Kingsford-Smith's monoplane *Southern Cross*, aboard the liner *Sonoma* from the Antipodes, July 6, en route back to the United States.

A warm welcome was extended to the two Americans by the local chapter of the National Aeronautic Association, members of the territorial aeronautical commission and members of the aviation committee of the chamber of commerce. Ten Army planes gave a demonstration of greeting. Charles Stoffer, Honolulu commercial pilot, also took part in the demonstration.

Warner, in the course of conversation, revealed that the trip from Suva to Brisbane was the roughest of all three legs of the voyage. No moon was visible until after 10 p. m. and it was frequently obscured by layers of clouds.

"We continually ran into high winds and rain", he said, "and spent half the night climbing and diving to avoid storms. On arrival at Brisbane we found our propellers showed the wear and tear of the rain."

THE first unit of the John Rodgers airport, a territorial enterprise 20 minutes by motor from the center of the city of Honolulu, has been completed. A field 2050 feet long, 900 feet wide, smooth and hard as glass, is ready for those who wish to use it. One pilot is already utilizing the airport, giving lessons to a number of pupils.

The second unit will be started at once and will be completed, it is believed, within a year. It will give Honolulu an airport which will care for both land and sea types of planes.

MAJOR C. C. MOSELEY, vice president and manager of the Western Air Express of California, came here July 6 to survey the territory for the possible establishment by his company of an airline here.

ANOTHER air survey is under way here for the Inter-Island Steam Navigation Co., a shipping corporation which proposes to augment its slower surface service, by the use of aircraft. Carl H. Dolan, Jr., Honolulu resident and a former member of the Lafayette Escadrille, is conducting the company's investigation, which, he says, will consume a period of four months.

Stanley C. Kennedy, naval aviator during the World War, is a vice president of the shipping firm.

MARTIN JENSEN has gone to the Pacific Coast with the *Aloha*, the Breese monoplane in which he won second place in the Dole race in 1927. He plans an extended tour of the mainland. His ship is carrying the Hawaiian flag, done in colors, on its fuselage.

OFFICIAL figures on the performance of the *U. S. S. Lexington*, naval aircraft carrier which set a record for steaming from the coast to Hawaii in June, were released by officers here shortly before the vessel departed for San Pedro with the battle fleet. The figures follow:

Left anchorage at San Pedro, 1:01 p. m. June 9; arrived at Diamond Head light, 11:08 a. m. June 12; elapsed time, 72 hours and 36 minutes; total distance steamed, 2,226 miles; average for entire run (speed) 30.66 knots. Best day's run; miles steamed, 768; average speed, 32 knots; average shaft horsepower, 120,000. The run by days: first 24 hours, 704 miles steamed, average speed 29.33 knots; second 24 hours, 736 miles steamed, average speed 30.67 knots; third 24 hours, 768 miles steamed, average speed 30.67 knots; last six-tenths of an hour, 18 miles steamed, average speed 30 knots.

C. C. MAIDMENT, Wright Whirlwind motor expert and member of the Lindbergh party which toured the United States, stopped in Honolulu a day, June 20, on his way to Australia where he is to check over the engines of the *Southern Cross*.

BAKERSFIELD NEWS

By ORVAL ADAMS

KERN COUNTY'S sixth municipal airport, a field 30 miles northeast of Bakersfield, Calif., was officially dedicated in June. Thousands participated in the celebration which marked completion of the Wasco port, another link in the chain of landing fields planned by Kern aviation enthusiasts eventually to connect every community in the county.

Landing fields are now ready for use at Bakersfield, Wasco, Kernville, Tehachapi, Mojave and Taft, all of them made possible through the air-mindedness of Kern county's officials and citizens. Late this summer, new links in the chain of landing fields which will establish a safer and more direct route across the Sierra mountains as a unit in a transcontinental airway, will be established.

To speed the progress of aviation development in the county, the Board of Supervisors of Kern recently appointed an airport commission headed by Howard Nichols of Bakersfield, a former major in the Army.

Since aviation development was placed on an organized basis in Kern county, a new 160-acre airport, declared by fliers to be one of the finest in the West, has been purchased near Bakersfield by the county. Thousands of dollars have been expended in equipping it with steel hangars, boundary lights and field beacons for night flying, shop facilities for airplane repairing and an office building at which all incoming and outgoing pilots are required to register.



First on Lindbergh Field

AS graphic evidence of outstanding leadership, San Diego Air Service Corporation, is the first school of aviation to be granted an operating franchise on Lindbergh Field... America's finest airport. Situated on San Diego Bay near the heart of the city, facilities for both land and seaplanes are available. This preferred location on Lindbergh Field results, inevitably, in greater pilot training efficiency.

You are invited to train on Lindbergh Field, the focal point of aviation in the "Air Capital of the West." An interesting booklet giving complete information about Lindbergh Field and the advantages of *Air Service Training* awaits your request. Mail the coupon today.

San Diego Air Service Corporation, Lindbergh Field



CONTACTS

By Frank E. Samuels

CHARLIE DYCER, of the Dycer Airport, spent a very pleasant fourth of July and with his new Lincoln-Page brought home most of the prize money offered by the committee in charge of the Banning Airport dedication. Winning as he did the Los Angeles-Banning race and the 50-mile, short course, around pylons, for OX5 jobs, Charlie wore a smile all day.

Dr. T. C. Young, in his folding wing Kinner monoplane arrived early at the meet and did a lot of good publicity work for the National Air Races. Theodore T. Hull of the American Aircraft and president of the Executive Committee of the National Air Races, flew one of the latest Fairchild cabin planes to the meet. Lieutenant Burgess, commander of the Army Reserve Corps at Clover Field, Santa Monica, was another visitor, flying down from Clover Field in a new observation plane. Planes from Marsh Field, San Bernardino, Santa Ana, Long Beach, Colton, Redlands, and in fact from all surrounding towns, dropped into the field during the day.

WHO, in the entire west, connected with aviation, doesn't know Arrigo Balboni? But who knows how he became interested in the airplane wrecking business? A barnstorming airplane pilot for years, until one unlucky Friday the 13th in 1923 while crossing the Tehaschepis Mountains, he had a bad forced landing, breaking a wheel. Leaving his plane for the night, on his return he found that mountain goats had eaten most of the cover from one wing. Eventually he made repairs and landed in a Western Avenue flying field just as the rainy season started in. The field was flooded and the water was over the lower wing of his plane until spring, rotting the fabric and spoiling all the wood work. Disgusted, Balboni decided there was a better chance wrecking planes for their parts than there was wrecking them on mountain tops and in the mud. We believe that he is the only one who makes a business of buying and selling wrecked airplanes.

THE LOS ANGELES Airways report the engaging of Earnest Davis, licensed transport pilot, well and favorably known to our California operators, who will work with Ole Olson as instructor and long flight pilot. Morris Gordon, one of the students, has shown such good work and is proving to be such a careful pilot that he has been engaged at the flying field as short-hop pilot, which speaks well for the course of instructions that he has received.

B. F. MAHONEY, who recently returned to the western factory of the Mahoney Aircraft Corporation from St. Louis where he has been in conference with the board of directors of the corporation, reports that the manufacturing of Broughams will begin in the St. Louis factory this month. The Mahoney Aircraft Corporation by taking over the Prudden-San Diego Airplane company's motor contract with the Wright Aeronautical Corporation will be able to go into production of 30 planes a month, with the opening of the new factory. John C. Nulsen, general manager of the corporation, and Bert Tindale, factory manager of the corporation, left for St. Louis, where they will supervise the building of the first Ryan Brougham in the new factory.

BOB BLAIR, California distributor for Buhl Aircraft, reports that he has just sold and will make immediate delivery of a Wasp-motored Buhl Airsedan to G. Allen Hancock. It was Mr. Hancock who presented the *Southern Cross* to Captain Kingsford-Smith and Captain Ulm on the completion of their California-Australia flight. The Buhl is the first of a fleet of ships to be used by Mr. Hancock in his freighting business, one of which is to be equipped with pontoons and will be used from his big freighter.

MR. C. C. McWhinney, attorney of Long Beach, has just purchased and taken delivery of a new Laird Commercial, three-place, Whirlwind-motored job, from Earl S. Daugherty, California distributor for the E. M. Laird Airplane Company of Chicago.

Mr. McWhinney has a cabin and flying field close to Big Bear Lake and always takes two friends with their baggage with him on his frequent trips down. Earl says the ship with this load takes off immediately from the Lake at an altitude of 7,000 feet.

ANNOUNCEMENT is made by the Standard Airlines, Inc., a subsidiary of the Aero Corporation of California, that the Tri-State Airlines has merged interests with the Standard Airlines, Inc., and that R. U. McIntosh, founder of the Tri-State Airlines, will be associated with the Standard Airlines in carrying out its expansion program. The Standard Airlines plans to extend the Los Angeles-Phoenix-Tucson line, that has been operated on a tri-weekly schedule for the past six months by the Aero Corporation of California, to Douglas, Arizona, Fort Worth and Dallas, Texas. Ten passenger Fokker monoplanes powered with Pratt & Whitney Hornet engines with a speed of 140 miles an hour will be used on the run.

THREE Westinghouse floodlights have been installed on Mahoney-Ryan field at San Diego and both firms are doing an extensive amount of night flying with passengers. This type of flying is very popular in San Diego as the number of lighted towns in that vicinity provide an unusual spectacle at night.

NAVY fighting planes have been putting on daily exhibitions of formation flying in preparation for the mass flight formation over San Diego during August 16-17-18. The crack Marine team, led by Captain Campbell, is specializing in rolls, loops, and rolls from the top of loops while in tight formation. Doug Kelley, chief pilot of the T. C. Ryan Flying Co., took a Monocoupe with Velie motor into the air and imitated the Marine Corps team. He was only excelled in the upside-down flying formation. Kelley explained this by the fact that he didn't have a safety belt on and hadn't practiced standing on his head while flying.

GLENDALE is a busy spot in the aviation industry just at present. Starting on the boulevard one comes first to the Otto Timm Aircraft company, where a new type of training ship is under construction. Then the Kinner Airplane & Motor plant, where there is a day and night shift of mechanics rushing production. The Slate all-metal dirigible is situated on the same field, and is just about ready to be given its trial flight. The Glendale field also is the headquarters of the General Aircraft Corp., California distributors of the Thunderbird, and houses the Wilson Aero Company, specializing in motion picture work and student instruction.

A little further along the boulevard, comes the Story propeller plant, a busy little plant at all times. Just a little further and we reach the Thunderbird Aircraft manufacturing plant, where a line of ships under different stages of construction are being worked upon day and night.

Just over the Glendale line into Burbank we reach the Lockheed Aircraft Manufacturing plant, where a continuous stream of "Vegas" are being turned out, ready to fly away. While at the Lockheed plant we had the pleasure of seeing Larry Fritz, chief pilot of the Maddux Air Lines, take delivery and fly for the first time a beautiful "Vega" monoplane which the Maddux line had just purchased and will use to handle extra passengers over their airline, and for hurry trips anywhere.

ONE of the fastest growing branches of the aviation industry on the West Coast is known as the Miller Airplane Products. I will admit that when Leslie Miller started I couldn't see where it could be a success, but I, like many others, who had the same idea, must take my hat off to Leslie! He has built up a business from less than $1,000 a month less than eight months ago to better than $30,000 for the month of June; with orders enough ahead to keep his plant running at full speed for the balance of the year. To increase production he has leased the entire building, where he started in a small store-room, he has installed a lot of new machinery, has fourteen high-class mechanics and stock and material enough to equip with his roller rocker arms, overheads and valve guides or to completely Millerize 1,000 OX5 motors.

What great assistance this business is to the flying fields, pilots and manufacturers of airplanes! Over 2,000 old engines have been made over for the trade and for pilots who have been able to keep in business, during the shortage of motors for light planes, while waiting for new production motors.

But the old racing fever is hitting him and Leslie has just purchased a new Lincoln-Page, is powering it with one of his Millerized OX5s and will enter the New York-Los Angeles race of the National Air Races. Those of us who saw his finish at the New York-Spokane race last September look for him to finish well up in front. More power to you Leslie.

DURING my rounds I have heard many complimentary remarks on the proposed, and now an assured fact, L. A. Metropolitan

(*Continued on next page*)

Buy MILLER

AIRPLANE PRODUCTS



REV'S FOR OX5's
By LESLIE C. MILLER
A book explaining all faults of the OX-5 Curtiss motor and the remedy for each fault. How to get more horsepower, efficiency, reliability and economy out of this type motor. The author has over 3500 flying hours experience with the OX-5.
PRICE ONE DOLLAR

Dealers Wanted

MILLER'S POSITIVE INTAKE VALVE CONTROL FOR OX'S

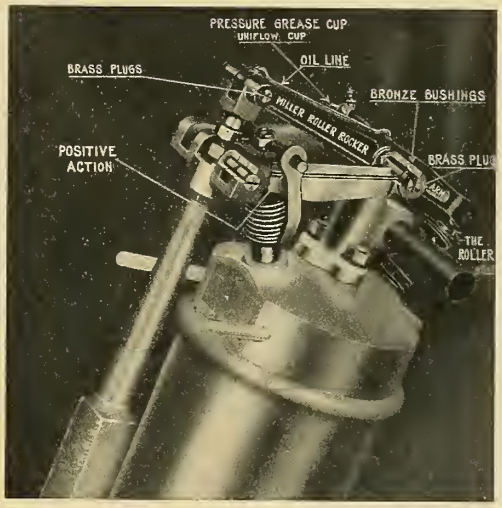
Saves 15% on gas, adds 20 to 50 rev's to the motor speed, takes all noise from the overhead, greatly reduces friction in pins, bearing surfaces, valve guide and pull rod. Over one thousand sets now in use on OX's in planes, speed boats and racing cars. Standard equipment on Alexander Eaglerocks and now being adopted by other leading manufacturers.

PRICE per set of eight $10

MILLER'S ROLLER ROCKER ARM

Preventing wear on exhaust valve guides and seats, doubles the life of the OX cylinder. The roller rolls freely across the valve stem end, instead of sticking and exerting a tremendous side pressure on the guide and valve seat as is the case with the former tappet. More power longer sustained.

PRICE $15
Per Set of Eight



THE NEW MILLER OVERHEAD

The large pins operate on Bronze Bushings, all four pins are oiled under constant pressure from Cincinnati Ball-crank uniflow lubricators.

The system is guaranteed to give twice the service of former OX overheads. It is impossible for the pins to lose out or for grit to get into any of the bearing surfaces.

Miller Roller Rocker Arms and intake valve controls are included in the Miller Overhead.

With push and pull rods	$90.00
Price as illustrated, per set of eight, less push and pull rods	85.00
With alemite connections, but less Cincinnati Ball-Crank Lubricators; with rods	78.00
Without rods	73.00

THE MILLER VALVE GUIDE REMOVING AND REPLACEMENT TOOL SET

Is a complete equipment for removing and replacing valve guides in old cylinders; all operations are by hand, no machinery necessary. Ninety-nine out of a hundred used cylinders can be put back in the service with this set.

Ream out the old valve seat and use oversize head valves.

Valve guide tool set	$35.00
Grey iron guides	.65
Valve seat Reamer set, all necessary reamers	22.50

Write for pamphlet fully describing all Miller Products

MILLER AIRPLANE PRODUCTS ARE SOLD ON 30 DAYS' TRIAL. MONEY REFUNDED ON ANY UNSATISFACTORY PURCHASES

MILLER AIRPLANE PRODUCTS

Write P. O. BOX 643, LOS ANGELES, CALIF., FACTORY, 3827 WEST JEFFERSON

Terms 5% discount for cash with order. 10% deposit required on all orders. Write your supply house or order direct.

(Contacts continued)

Airport in San Fernando Valley. I have also spoken with a number of people who have secured space on which to build hangars, manufacturing plants and buildings for aviation accessories. The idea is a novel one. The ownership of ground enables purchasers to erect permanent buildings; the class A runways enable manufacturers and dealers to demonstrate their planes at all times and a perfectly lighted airport will enable the many transport companies facilities for landing both day and night. A weather bureau station and radio connection will be installed at once.

STANLEY SHORT has just purchased a new Waco-10 for student instruction and is as proud of it as a boy with a new toy. If there is one place that yours truly likes to visit on a hot day it is Shorts Airport. There is always a cool breeze and plenty of shade!

AMONG the many people who have been utilizing the Los Angeles-Phoenix-Tucson Airline for rapid and economical transportation are Nat Ross and Dick Smith of the Universal Pictures Studios. They are arranging to make their next series of pictures near Prescott, Arizona and are sending their leading players and all equipment necessary for the series by air.

Jack Frye, president of the Aero Corp. of California, reports ever increasing business over the line and expects to add more ships in the near future.

ONTARIO AIR MEET

By Norman P. Henderson

SEVERAL THOUSAND people attended the recent celebration in the city of Ontario, California, to mark the opening of the airport. Both the port and the celebration were sponsored by the American Legion.

Visiting aviators were directed to Ontario's new airport by a mammoth sign, the letters of which were each 60 feet tall and 45 feet wide. Hotel accommodations, meals and cigars were free to all fliers.

Airplane races, stunt flying, contests of all kinds, parachute jumping and a concert by the American Legion band featured the all-day program.

The winner of the airplane race to a distant city and return was L. R. McGehee of the Western College of Aeronautics, Los Angeles, in an OX5 Travel Air. E. Burrell Smith of Los Angeles in a long wing Eaglerock, and Don Cobb of Redlands in a Waco-10 finished second and third.

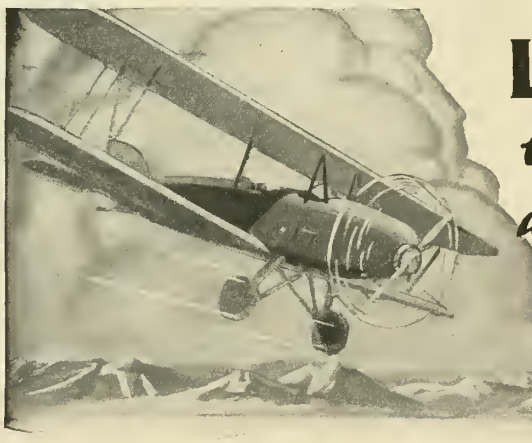
Leland L. Miles in a Waco-10 broke all San Bernardino county records in the take-off when his plane left the ground in 15 seconds. Smith's Eaglerock was next, 17 seconds, and Vance Phillips of Los Angeles, in a combination wing Eaglerock, was third. The test required each pilot to stand on the ground, away from his plane, and when the pistol was fired he would climb aboard and turn the switch while his mechanic twirled the propeller.

Spot jumping in parachutes was won by Glenn Harvey, of Long Beach, with Fritz Babbs of Upland second and A. R. Morrison of Los Angeles third.

Leland L. Miles of San Bernardino won first prize in stunting, with Lieut. Ralph Vaughan of Ontario second.

In the dead stick landing contest, Miles stopped 24 feet from the mark. Fritz Secor in a converted Boeing was second and Vaughan's Waco was third. The spot landing prizes were won by Secor, Miles and Vaughan, respectively.

Those who participated in the Ontario air meet were Lieut. J. G. Berner of San Diego, pilot of a Navy Vought; Lieut. J. D. Givens of March Field, six-place cabin Douglas transport of the Army; Lieuts. D. M. Schluter, W. L. White, H. S. Vanderberg, Plummer, L. D. Weddington and Capt. J. H. Davidson, all of March Field, piloting six PT3 Army planes; Rex Hicks of Redlands, Curtiss JN4; Roman Warren of Riverside, International; Leland L. Miles of San Bernardino, Waco-10; Fritz Secor of Ontario, converted Boeing; E. Burrell Smith of Los Angeles, Alexander Eaglerock; L. R. McGehee of Los Angeles, Travel Air; T. C. Alexander of Los Angeles, Monocoupe; Vern Speich of Midway, International; Eddie Martin of Santa Ana, Waco-10; J. Martin of Santa Ana, Waco-9; T. S. Lundgren of Los Angeles, Travel Air; Zenith Aircraft pilot, Midway, Waco-10; Vance Phillips, Los Angeles, Eaglerock; Lieut. Ralph Vaughan, Ontario, Waco-10; Don Cobb of Redlands, Waco-10.



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All instructions under personal supervision of William J. Waterhouse, nationally known aeronautical engineer.

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Remember, you do not have to be a flyer to earn good salaries in aviation. For each man in the air there must be many men on the ground . . . engineering, designing, constructing planes . . . serviceing them, overhauling, inspecting.

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Dean]

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AIRPLANE DRAFTING	AIRCRAFT WELDING
AIRPORT DEVELOPMENT	"FLYING"

For information, write the secretary

Say you saw it in AERO DIGEST

An Important Announcement . . . . . Concerning Floco Aviation Motors —

The Floco seven cylinder radial air-cooled aviation motor, formerly produced by Frank L. Odenbreit, incorporated, will be manufactured by the Axelson Machine Company.

After a thorough survey of the aviation motor field in America, and after exhaustive tests, the Floco motor was selected by this organization on the strength of its exceptional merit. This organization, therefore, purchased Frank L. Odenbreit, Incorporated. It automatically places behind the immediate production of the Floco motor the entire pressure of its resources. Airplane manufacturers are invited to write for information concerning quantity delivery.

AXELSON MACHINE CO.
Airplane Motor Division
LOS ANGELES

OAKLAND AIR NEWS

MAJOR LIVINGSTON IRVING, Dole race entrant who met with ill-luck at the take-off, has announced his intention to fly the Pacific from Oakland to Tokio with John Kubota, Japanese pilot.

The two plan to fly from the Oakland municipal airport to Tokio by way of Honolulu and the Marshall Islands, or to make a non-stop flight from Tokio to Oakland, some time in September or October.

DURING the month of June, 6732 plane landings were recorded at the Oakland municipal airport, 4790 passengers were carried and the gross revenue accruing to the city for the operation of the field was $2,786.89.

For the first six months of this year the airport clerk's books show that 30,571 plane landings have been made at the municipal field, 20,703 passengers have been carried and the airport's gross revenue has been $12,843.48.

WESTERN AIR EXPRESS has selected Oakland municipal airport as its base of operations for the passenger service between the San Francisco bay region and Los Angeles.

Members of the board of port commissioners, the non-political appointive body which governs Oakland harbor and airport affairs, are considering the erection of a fourth all-steel hangar at the municipal flying field. At the present time the administration building is being doubled in size in order to care for the government weather bureau recently established at the Oakland field.

Boeing Air Transport, Pacific Air Transport, Western Air Express, Maddux Air Lines and the Mutual Aircraft Corporation are the established transport lines operating from the Oakland field at the present time. In addition to these there are 36 taxiplanes regularly quartered at the municipal airport.

The pilot's list shows that 200 fliers, including students, are making use of the city's airport.

PLANS for a daily check of the upper air currents of the Pacific ocean, to be carried on by masters of vessels at sea, are being worked out by Captain W. B. Voortmeyer, aerial navigation authority, who plotted the Oakland-to-Sydney course of the *Southern Cross.*

Captain Voortmeyer proposes to have ship captains make observations twice daily with balloons such as are used by the weather bureau. At the end of a year's time the numerous records can be compiled and interpreted for navigators on the transoceanic airlines of the future, he believes.

The federal weather bureau has approved his plan and Captain Voortmeyer at present is consulting with steamship concerns to obtain their co-operation in gathering data.

A "GO by water and return by air" service between Oakland and Los Angeles has been announced by the Los Angeles Steamship Company and the Western Air Express.

Passengers may purchase tickets from either concern, which allow them to make the coastal trip by steamship one way and airliner the other.

REGULAR night passenger sight-seeing hops are being offered at the Oakland municipal airport by G. H. Willingham.

THE Oakland municipal airport is the base of operations for the Pacific Coast Air Service whose planes are patrolling California forests during the summer.

A 600-mile flight over the national forests in the Sierras was made in less than six hours on the first day of operation. Joe Barrows is operations manager of the company.

CAPTAIN IENAR E. ELM has organized the Elm Aircraft Co. to operate classes in ground work and practical aeronautics in addition to handling distribution of airplanes. Captain Elm holds a Department of Commerce pilot's license and both airplane and engine mechanic's licenses.

IMPROVED air mail service for Seattle, Portland, and the Pacific Northwest in communication with Oakland, has been brought about by addition of a special Oakland pouch made up at Vancouver, Wash.

Air mail from North Coast points arrives at Oakland Airport at one p. m. and is delivered in the city immediately. Mail from Oakland for North Coast points is also handled in special pouches for expedited handling.

Heretofore, air mail to and from Oakland on Pacific Air Transport planes was landed and taken off with San Francisco mail at Crissy Field, and had to be taken across the Bay by ferry boat, resulting in some delay.

A NEW sight-seeing tour of California has been inaugurated by Mitchell Air Tours and the Western Air Express, Inc.

Starting from the Oakland municipal airport, passengers first are taken over the San Francisco bay region, then out over the fertile expanses of the Sacramento and San Joaquin valleys and California's famous Yosemite valley.

The tour consumes two and one half hours and the price of the scenic trip is $50 per passenger. Tri-engined Fokker monoplanes are used for transporting the tourists.

A TRI-WEEKLY airplane passenger service is now being operated between Oakland and Sacramento by the Capital Air Lines. H. G. Andrews is chief pilot of the new concern.

The plane schedule has been arranged so that the capital ships will serve as "feeders" for the planes of other transport lines operating from the municipal airport.

DUE to the increase in demand for greater quantities of fuel, a 2,000-gallon underground gasoline tank is being installed at the Oakland municipal airport by the Standard Oil Company.

COLORADO AIR NEWS

THOUSANDS of visitors attended the Open House Day Celebration at the new factory buildings of the Alexander Aircraft Company, at Colorado Springs on July 7. The event came at the close of the Master Salesmen's Convention of the Alexander Film Company, an associated corporation.

Members of all aircraft production divisions directed visitors through their departments and explained the processes of airplane manufacture. Late in the afternoon an Eaglerock was test flown as part of an aerial exhibition. Novelty automobile races and airplane races were part of the program.

AIR RODEO AT COLORADO SPRINGS

THREE days of hot contests and western hospitality will lure tourists and residents of Colorado Springs, Colo., for an Air Rodeo on August 10, 11 and 12. Pilots and planes from all sections of the United States will compete for cash prizes underwritten by the business men of that city.

For years past, the Chamber of Commerce and business men of Colorado Springs have conducted an annual rodeo. Cowboys and professional rodeo performers came from all over the country to exhibit their prowess with lariat and spurs.

With progress has come the passing of the old western rodeo at Colorado Springs and the new factory buildings of the Alexander Aircraft Company now stand on the old rodeo site.

Not to be outdone by the march of progress, the business men of Colorado Springs have organized Pikes Peak Aeronautique, Inc., to finance and promote an annual air rodeo at the Municipal Airport at Colorado Springs.

The first event of the first meet in August will be the On-to-Colorado Springs Race with $1,000 as the first prize. Five other prizes are offered. In addition, $50 expense money will be paid every pilot who flies his ship in from outside of Colorado and is not a winner in this race. Pilots must arrive at the Municipal Airport by 12 o'clock noon, Friday, August 10, and may start from the home field any time after August 6, 12 o'clock midnight.

The balance of the three days will be full of flying activity—races, dead-stick landings, balloon busting and the usual contests.

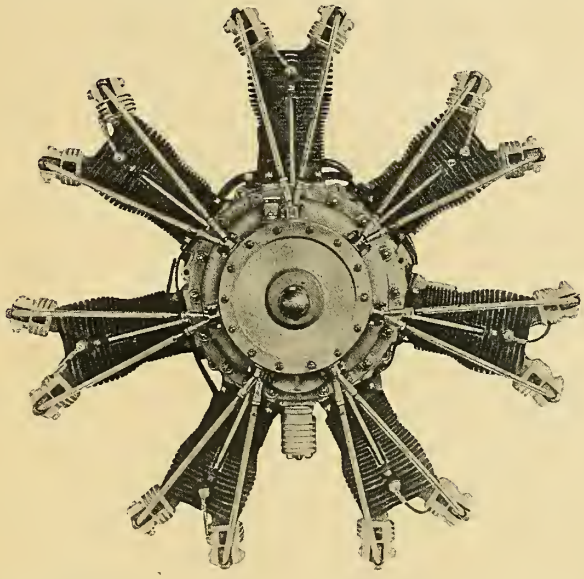
AIRPORT DIRECTORY

THE Standard Oil Co. of California has issued a new edition of its directory—"Airplane Landing Fields of the Pacific West."

This third edition, published by this company for complimentary distribution to the pilots of the West, contains special large maps of landing fields, airway signs and illuminated airways in addition to information on the location, size and facilities offered at the greatly increased number of landing fields in Arizona, California, Nevada, Oregon and Washington.

HALLETT

America's Commercial Aviation Engine



ACROSS the aeronautical horizon comes a new motor to take its place on the American market — the 130 H.P. Hallett 7-cylinder Radial. This motor is the result of a long series of experimental effort to determine the most efficient and adaptable engine for modern production aircraft, and in the ultimate product we are offering an air-cooled motor capable of upholding the former engine successes of the Hallett Manufacturing Co.

This motor is suitable for any moderate size commercial airplane. Your manufacturer can now supply you with Hallett Aviation Engines. Demand them when ordering your next plane to secure efficient, dependable, economical performance.

The Hallett motor is built for long-lasting service and continued performance. Not a part has gone into this motor without a long period of intensive research and experimental tests to determine its worth. The introduction of this motor begins the trend of a heavy duty engine for small aircraft. Where the best is needed, the best has been provided for. That is why we believe the Hallett aronautical motor will be the most dependable and efficient in its class.

Specifications and data: 7-cylinder air-cooled; 130 H. P. at 1800 R.P.M.; displacement, 526 cu. in.; Bore, 4⅜"; Stroke, 5"; Weight, 490 lbs.; Timken Bearings; Bosch Magnetos; Zenith Carburetors.

HALLETT MANUFACTURING COMPANY

3018 W. 67th Street, Los Angeles, California

NORTHWEST AIR NEWS

By F. K. Haskell

JIMMY RINEHART, nineteen year-old Portland aviator, in his first air endurance trial at Seaside, Ore., June 29th, brought his plane down at 9:16 o'clock with a world's record to his credit and a balance of ten gallons of gasoline still in the tank. The official time of the flight was 16 hours 34 minutes 25 2/10 seconds. He flew an American Eagle, for which he is dealer in Portland.

Rinehart's feat is the first officially recognized endurance record for a plane of the OX5 class. He reported that his motor was working perfectly and that he could have stayed in the air for a longer period. Almost perfect flying weather was encountered during the flight.

The flight was recorded and certified by Lieut. Valentine Gephart of Seattle, secretary of the N. A. A.

TO ACCOMMODATE the large commercial planes which frequently visit the Spokane airport a new hangar with a 200-foot frontage and 100-foot depth is being built at a cost of $20,000.

SINCE its establishment September 1st, 1926, the Pacific Air Transport company has carried 1,547 persons over 500,000 passenger miles along its route from Seattle, through Portland to San Francisco and Los Angeles, according to report of W. G. Herron, vice president in charge of traffic for the Boeing Air Transport Company.

The Boeing company, which controls the P.A.T. has transported 1,241 persons over 884,492 passenger miles since it began operation of its transcontinental route July 1, 1927. The Pacific Air Transport route is 1,099 miles long and the Boeing route from San Francisco to Chicago is 1,918 miles.

ALL records for mail carried over the Pacific Northwest division of the transcontinental mail were broken in June, according to announcement of the Varney Air Line.

The average daily increase carried during the month was 262 pounds, which represented a 10 per cent gain over May, the previous month's record, and a 90 per cent increase over June 1927.

June records showed an average of 75 pounds of air mail flown into Seattle from the East every day, while 73 pounds were sent out.

TWO of the largest aeronautical institutions in Portland, Ore., Aeronautical Pursuits Company and the Bush Flying Service, Inc., have merged according to Captain Jack Clemence, chief pilot, who will head the consolidated company with headquarters at Vancouver, Wash. Ellery Jepson will act as alternate pilot and instructor.

CLARENCE H. FARNHAM, who recently retired from the Aeronautical Pursuits Company, will hereafter devote his entire time to the sale of Travel Air planes for which he is Oregon distributor.

THE City of Spokane has appropriated $2,175 for the purchase of four more Westinghouse airport floodlights. These, with the one already installed, will give Spokane one of the best lighted airports in the Northwest. They will be installed before the visit of the National Air Tour planes.



P. & A. photo.

W. E. Boeing with placque presented him by King's County Commissioners in honor of his aviation activities

PORTLAND will be the western terminus of a transcontinental airline, according to announcement of Charles V. Eakin, president of the Pickwick Airways and Union Air Lines, which recently took over the West Coast Air Transport Company.

Daily passenger service between Portland and San Francisco is scheduled for August 1st; a daily service between Portland and Spokane on August 15th and daily service from Portland to Salt Lake City and on to Chicago by way of Denver and Kansas City, as soon thereafter as possible.

The southern business will be started by the Pickwick Airways, a subsidiary of Pickwick Stages, now being organized at Los Angeles. Bach planes will be used on all the routes.

AS a true sky pilot R. Robert Crawford has recently initiated an American Eagle biplane, purchased by the Apostolic Faith of Portland, Ore., for use in carrying religious work to points far from the regular lines of travel.

The Wings of the Morning is the name of the plane and the name and insignia are painted on the side of the fuselage in glittering letters. A large red sun, rising above a blue-green ocean is flanked by two gold and blue wings.

Mr. Crawford, one of the leaders in the Apostolic Faith mission, formerly had a plane and at that time earned the title, "The Sky Pilot."

A. D. McKENZIE, flying an American Eagle plane, won the Swan Island-Silverton, Ore., cross-country race and the J. C. Penny trophy when he flew to Silverton from the Portland field in 22 minutes, 45 seconds.

There were seven starters eligible to compete in the OX classification of planes and all finished. The race was held as a preliminary to Silverton's second annual air circus, under the auspices of the Silverton post of the American Legion.

Second place in the air derby went to Lieut. Floyd Keadle flying an Eaglerock; third place was captured by Pilot-Owner Cecil Graul in a Waco.

Aerial maneuvers started with formation flying over Silverton and Salem, led by Captain Eagle. The loop contest was won by Lieut. Keadle who took the Legard and Adams trophy. Lieut. Case was second; Basil Russell, third.

The 10-mile OX5 plane race was won by Tex Rankin in 7 minutes 31 seconds. Keadle was second in 7 minutes and 32 seconds.

The dead stick landing contest for the Patty Motor Car Company prize was won by Art McKenzie, who landed three feet from a mark on the field. Goldsmith was second, with Rankin third.

Keadle and Rankin won first in the relay race, with the McKenzie team second. The stunt contest ended in a tie between Tex Rankin and Lieut. Case, with Goldsmith third.

Parachute jumps were made by Lockwood of Seattle and Fred Strom of Beaverton. Tex Rankin was awarded the Ames Hardware trophy and George W. Steelhammer trophy for the largest and smallest planes on the field. Captain Eagle was presented a trophy for his coöperation in the aerial circus.

THREE Kiwanians, who also are aviation enthusiasts, dropped into the National Conclave held at Seattle recently. They are Ted Wiche of New York, Fred Kreuscher of Brooklyn and Clyde Backus of the North Shore Kiwanis Club of Chicago. The two former made the trip in a Fairchild cabin plane piloted by Arthur L. Caperton.

DEWEY WILSON has been made general manager of both the Gray's Harbor Airways Company of Aberdeen, Wash., and its subsidiary, the Gray's Harbor School of Aeronautics.

THE Rankin Flying Service of Portland, Ore., has obtained the agency for the Monocoupe, in Oregon, Washington and Idaho.

A NOVEL course of procedure has been adopted by Edward S. Campbell, Jr., project engineer with the Boeing Airplane Company in that he has designed a new plane known as design number 81 for the Seattle company, supervised its construction and finally flight tested it himself.

His system is universally applauded by other fliers because they realize that an engineer isn't likely to make any mistakes on a plane in which he makes the first flight.

Design 81, although intended primarily as a light two-place commercial plane, is designed to fully conform with Navy Department training plane specifications. Government specification materials and standard Government practices have been utilized throughout.

A description and illustration of this plane appear in the technical section of this issue.

(*Continued on next page*)

Miller Airplane Products

In line with our policy of improving our products every day, we are now improving the delivery service on all products. An arrangement has been effected whereby there is now a complete stock of all our materials for the OX5 Curtiss motors on hand and ready for prompt shipment from five different supply bases in the United States. Thousands of OX5 operators will save many hours of waiting for our materials by ordering from the nearest one of these supply bases, or from any one of the many other supply houses who also carry smaller stocks.

We know what service means to the customer when he needs our materials, and for that reason the distributors named in the following list were picked because of their reputation for reliability and service. **In the western states Miller Airplane Products will continue as western supply base.**

Nicholas-Beazley Airplane Co., Marshall Mo.; Robertson Aircraft Corp., Anglum, Mo.; Johnson Airplane & Supply Co., Dayton, Ohio; Floyd J. Logan Airplane Co., 716 West Superior, Cleveland, Ohio; will supply the demands of all our middle-west and eastern dealers and customers, extending the same courtesies, and even better service, than was possible from the west coast.

If you are not already fully familiar with the advantages to be gained in Millerizing your OX5, write or wire the nearest distributor for descriptive folder and price list, and if you are conducting an aircraft supply business ask for dealers' proposition.

Yours for more Rev's,

Leslie C. Miller

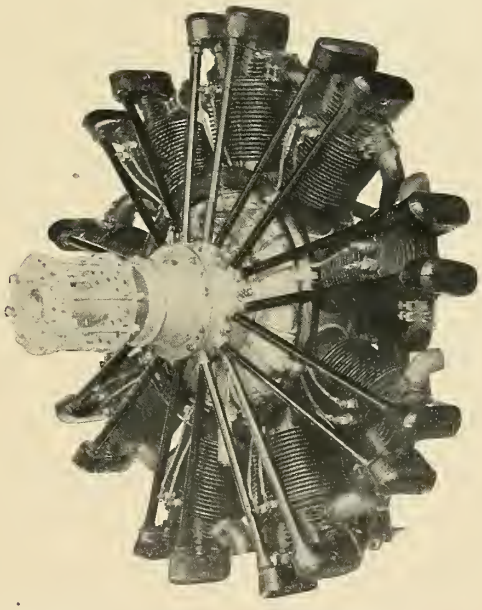
MILLER AIRPLANE PRODUCTS

P. O. BOX 643 or 3827 W. JEFFERSON ST.,
LOS ANGELES, CALIF.,

Phone Empire 3570

Pep up for the Los Angeles Air Races in September!

MENASCO



Sixty Extra Horses

Menasco dependability lies in the Menasco-Salmson power range. Sixty extra horsepower, over and above normal, stand waiting in reserve to carry the Menasco-motored plane through every adverse condition met in the air.

MENASCO MOTORS COMPANY

6718 McKinley Avenue Los Angeles

(Northwest Air News continued)

THE new municipal airport at Roseburg, Ore., is now ready for use. While the runways now available are only of a temporary nature, they are sufficient for handling the largest ships with safety.

COMMERCIAL AIR TRANSPORT COMPANY, operating a flying school at Everett, Wash., has made an exceptional record during the past month in enrolling an average of one student per day. They have secured the exclusive rights to the use of the Rankin System of Flight Instruction north of Seattle. John R. Scott is manager.

THE SEATTLE AIRWAYS, INC., is now located at Boeing Field, where more than forty students are receiving instructions under the tutelage of Ansel Eckman, pilot, in a Lincoln-Page, for which this company is distributor.

LIEUT. ERIC NELSON, of Round-the-World Flight fame, has left the Army to become sales manager of the Boeing Airplane Company of Seattle.

AN inspiring scene was afforded by the initial trip on July 13 of the Gray Line Tours "rubberneck" in its aerial tour from Seattle around Mount Rainier. Rock and ice formations unfolded their secrets as the four-passenger plane circled the summit, which soars 14,408 feet high. From this dizzy height also was visible other famous peaks including Mt. Hood, Mt. St. Helens, Mt. Adams and Mt. Baker.

The initial trip inaugurated a regular sight-seeing service by the Washington Aeronautical Association. In the party were Floris Nagelvoort, president Seattle Chamber of Commerce, Mrs. Nagelvoort and Mr. and Mrs. Harold Turnblad. Alex Holden was pilot.

WESTERN AIRLINES, INC., FLYING SCHOOL

THE WESTERN AIRLINES, INC., Flying School of Yakima, Wash., is operating on the newly dedicated 80-acre county airport, three miles from center of city. The field has two runways, one 3,000 feet long, the other 2,000 feet long, both runways being 300 feet wide.

A complete course of instruction is offered covering both flying and ground training. Flying lessons are also given. The flying instruction consists of not less than 10 hours' dual instruction in the air, also cross-country flying fitting the student for Private Pilot License.

Ground instruction is given in the shop two evenings a week which consists of combined technical and practical training in the care, maintenance and actual repair of planes and overhauling of motors, together with the theory of flight, stability, control and elementary navigation.

WASHINGTON AIR NEWS

By C. M. LITTELJOHN

A NEW link will be forged between Seattle and Alaska by the establishment of a number of landing fields in the near future along the British Columbia coast. John Hooper, the president of the American and Canadian Tourist association, is touring the section between Seattle and the Alaskan territory to make an estimate of the feasibility of a new line to the North.

MARCH'S POINT, east of Anarcortes, will be the new airport for Anarcortes.

ELMA will soon have an airport. Plans are being made by the business men of that city to buy 44 acres. W. T. McBride, president of the Chamber of Commerce, hopes to acquire a site next to the Gray's Harbor fair grounds.

BELLINGHAM'S airport will be busy during August at the time of the holding of the Northwest Washington Fair. An air circus will be the main feature this year of the fair to be held at Lynden, near Bellingham.

Z. F. BALLANTYNE, managing director of the Seattle Airways, Inc., announces plans of his company to build airplanes. Construction of a three-place biplane has been started and a complete aviation shop is being built.

JULES B. HYDE has been selected to manage the municipal airport of Seattle.

MABTON has recently completed a new airport.

A NEW airline from Seattle, to Portland, to Boise, to Salt Lake City, is expected to be started in the near future. The Varney air lines are inspecting suitable equipment for such a service.

"BOEING FIELD" is the name by which the municipal airport at Seattle will be known, in honor of William E. Boeing, head of airplane development of the Pacific Northwest.

Inasmuch as the new municipal airport will be known as Boeing Field, Verne Gerst, of the Seattle Flying Service, announced that the old Boeing Field, situated near the Boeing plant, will now be known as the S. F. S. field.

A RIGID new code has been prepared at Gray's Harbor to more efficiently manage the new airport there. The Gray's Harbor port commission took over the operation and management of the field and has made provisions for safeguarding its future. It does not allow flying at less than 600 feet, nor stunting over Gray's Harbor cities of Western Washington, and requires that all firms entering the commercial flying business with this airport as a base must furnish $20,000 to $40,000 bond insurance, insuring the port of Gray's Harbor against damage suit.

THE DANIEL GUGGENHEIM FUND for the Promotion of Aeronautics recently donated $290,000 to the University of Washington at Seattle. This will include the establishment of an aeronautics building.

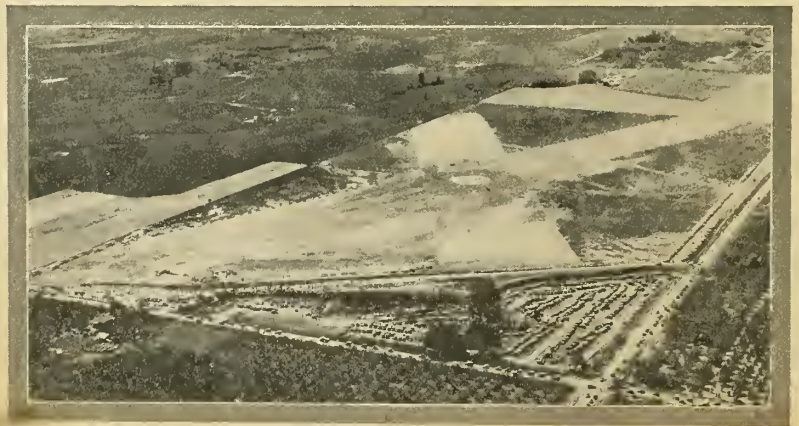
A SPECTACULAR air circus will be staged at Centralia, Wash., August 9th in conjunction with the annual departmental convention of the American Legion, which will be held at that time. Trophies and cash prizes will be awarded for honors in flight contests.

SPOKANE AIR NEWS

A SECOND company for commercial aviation and school for flying has been organized in Spokane, with the formation of the Spokane Airways, Inc., which recently purchased five hangars on the Parkwater field owned by Dr. S. E. Langley, and plans to start construction at once on twelve more. The company will use international airplanes.

The officers are Captain H. J. Taplin, president; W. H. Williams, vice president, and E. H. Muller, secretary.

CONSTRUCTION of a new four-plane commercial hangar at the municipal field at Parkwater will be started in a few days by the Mamer Flying Service. The hangar will have a 150-foot frontage, will be of fireproof construction and equipped with every modern convenience. The company will retain its present hangar quarters.



Yakima County Airport, home of Western Airlines Flying School.

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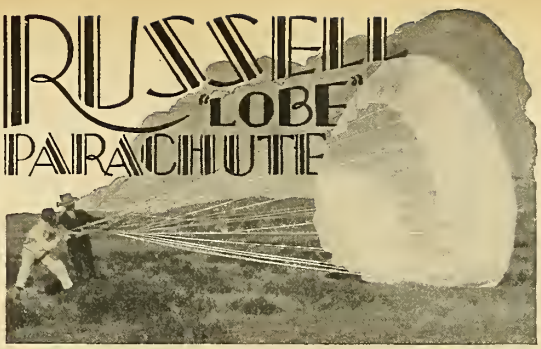
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UTAH AND IDAHO NEWS

By Glen Perrins

OGDEN, UTAH, was officially placed "on the air" June 30 with the formal dedication of the Ogden airport. It is estimated that 30,000 persons were at the airport to witness the day and night program. An aerial exposition was displayed by eight local and visiting planes.

The local airport is now a link in the Salt Lake-Great Falls line of the National Parks Airways, Inc.

PLANS to make Ogden the starting point of airplane tours to Bryce, Zion and the Grand Canyon were outlined to the city commission here recently by A. Smith Nelson, of Salt Lake City, representative of the Scenic Airways, Inc. Mr. Nelson has obtained hangar space at the new Ogden airport.

SALT LAKE will be a night control point for international air races, to be held between New York, Windsor, Canada, Mexico City and Los Angeles from September 8 to 16.

ARTHUR O. WILLOUGHBY, former assistant traffic agent of the U. S. air mail service, has been appointed assistant superintendent in charge of all western territory in regards to governmental air mail contracting.

THE WESTERN AIRCRAFT DISTRIBUTORS, INC., of Salt Lake City, recently received from the Farmingdale, L. I. factory of the Fairchild Company, a cabin passenger plane which will be stationed at the Woodward field and used by the company.

THE SALT LAKE CITY COMMISSION recently voted an additional appropriation of $3,000 to complete payment for improvements at Woodward air mail field. Underground cables have been laid to substitute for overhead high tension wires and the field is greatly improved.

MORE than 1,000,000 miles without a serious accident is the record of Western Air Express, Inc., according to reports reviewing its progress since service was established between Salt Lake and Los Angeles in 1926.

THE THOMPSON FLYING SERVICE, INC., was again licensed by the city commission to operate a hangar and other service for commercial airplanes at Salt Lake City's field.

BORDER lights are to be installed in the Burley, Idaho, airport by the city council. It is believed that night flying will soon be under way on the Salt Lake-Boise-Pasco air mail route and the landing field will be put into condition for any emergency. Beacon lights are also being contemplated at stated intervals on all this route.

DEFINITE assurance has been given that Cedar City, Utah, will furnish ground for an airport and the site will soon be chosen.

ARIZONA AIR NEWS

Arizona Air Survey

THE first aerial pictorial survey o entire state ever attempted was c pleted successfully by *The Arizona Repu can* on June 16. During the survey the *publican* fliers covered a course of 3 miles of Arizona airways in 36 hours and minutes actual flying time. The entire s vey required twenty days and more than splendid aerial pictures were secured a result.

Members of the air crew were Bill Kin ley, pilot, and E. D. Newcomer, aerial p tographer. The survey also included ground crew, consisting of Wallace A. M rison, manager and advance agent; Orv Bechtel, laboratory chemist, and Sam Witten, aviation mechanic.

The purpose of the survey was twofo first, to arouse a healthy interest in aviat throughout the entire state, and, secondly, secure an aerial survey of an entire state picture form.

On the flight Mr. Newcomer photograph the many scenic wonders and industrial a agricultural development of the state—t world famed Grand Canyon, Painted Dese Petrified Forest, the national parks and mo uments of Arizona, the great virgin fores of pine in the north, the copper districts Jerome, Clarkdale, Ajo, Bisbee, Globe a Miami and the agricultural empire of t central and southern portions of the stat

Kingsley and Newcomer landed the "R and W" special biplane on every larg airport in the state.

Novel Free Gift for Aero Fans

We present a complete series of facsimiles of "The British Gazette" to every new annual subscriber to "The Aero Field." "The British Gazette," the only daily newspaper issued by the British Government, appeared for eight days only during the great general strike and all editions were largely distributed by aeroplanes. It is an unique souvenir, commemorating the value of aviation during an epoch-making crisis.

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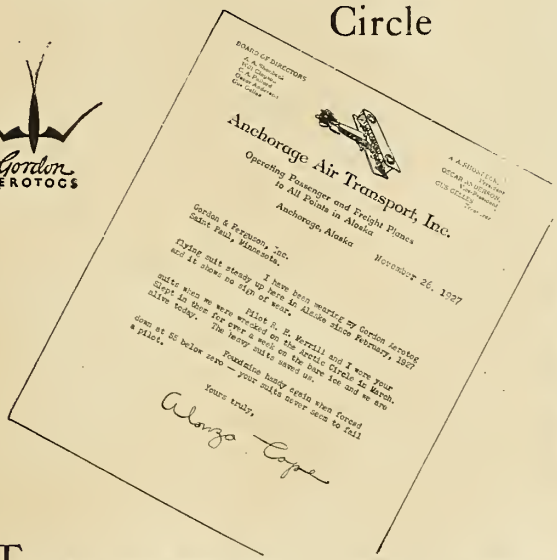
Will be offered to all contestants and visitors at the National Air Races in September. Our shops are adequately equipped to service and overhaul all types of water-cooled and air-cooled motors.

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Saint Paul, Minnesota.
I have been wearing my Gordon Aerotog flying suit steadily up here in Alaska since February, 1927 and it shows no sign of wear.
Hink S. B. Merrill and I were your suits when we were wrecked on the Arctic Circle 1st March. Crept in there for over a week on the bare ice and we are alive today. The heavy suits saved us.
Sometime hardy again when forced down at 65 below zero — your suits never fail to fail a pilot.
Yours truly,
Alonzo Cope

THE above letter speaks volumes for the warmth and splendid quality of Gordon Aerotog flying suits. Gordon Aerotogs are made from the finest materials obtainable. Expertly finished by hand. They include fur-lined, wool-lined and all-leather flying suits; leather blouses and jackets; leather or cloth helmets, gloves and mittens. If your regular dealer cannot supply you, write to us today.

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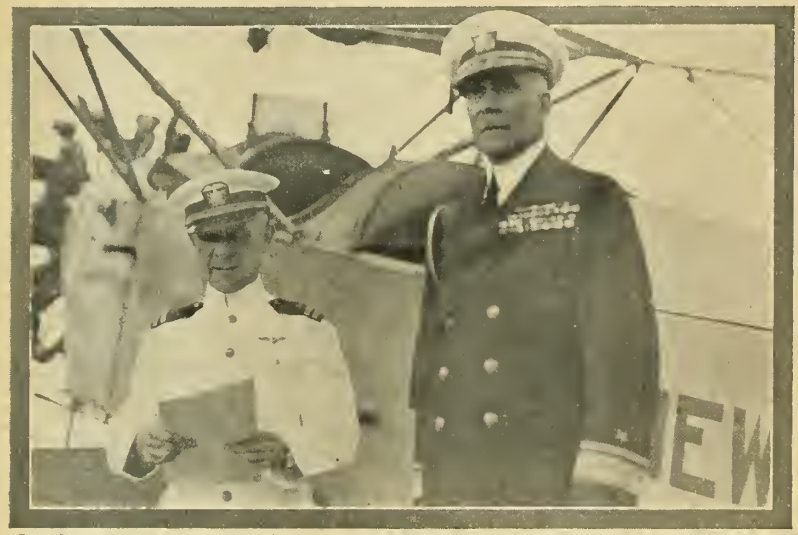
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NEWS OF THE AIR SERVICES



Lt. John Iseman commanding Rockaway Air Base reading order which places the base under Rear Admiral Louis Josephthal, commander-in-chief of New York State forces, for use of the Militia and the Naval Reserve.

N. Y. STATE NAVAL MILITIA TAKES OVER ROCKAWAY AIR BASE

By H. R. Schaeffer

NEW YORK STATE now has an aviation training station. Formal possession was acquired recently when the United States Navy turned over to New York State Naval Militia the Rockaway Air Station. Rear Admiral Louis M. Josephthal, commander-in-chief of the New York State forces, accepted the Station for the State.

This station is located on city property formerly occupied by the Jacob Riis Park. The property was turned over to the government for an indefinite time during the World War. The N-C boats were housed here and departed from this base in 1919 on their transatlantic flight.

In the formal transfer of the Station, Rear Admiral Josephthal stated:

"This is the only air station in the country devoted to the exclusive use of a Militia and the Naval Reserve. It is the first step toward greater expansion of the State's air forces. We now have here some 246 officers and men. I hope within two years to have a thousand. That is, of course, if we get the necessary support of the Federal Government.

"I have hopes that the Naval Air Station at Rockaway will become one of the biggest and best equipped in the country. We must work hard to secure appropriations from the State and Federal Governments to make our dreams come true.

"I sincerely believe in the future of aviation, both in war and in commerce. In war, the airplane is swift and deadly. In commerce, it is swift, efficient, economical. We must get together to develop it to its highest uses in both spheres.

"I hope in the very near future to procure planes for the training of men in all parts of the State. At Watertown there is an efficient group of men. Planes should be procured for them. At Rockaway we have seven planes. But we want a dozen and expect to have them before long."

Thirteen members of the Marine Corp Aviation Unit will train at Rockaway and there are 22 students receiving their training there now. Before taking the air field they were compelled to train on the old *U. S. S. Illinois*.

Rockaway Air Base is ideally located in that seaplanes can land in almost any kind of weather since there is a natural protection with a channel inland from the ocean. The airport now occupies 94 acres of land.

Lieutenant John W. Iseman of the Naval Reserve is in command at the station. Lieutenant E. K. Wildman is the executive officer.

VOUGHT "CORSAIR" FOR ASST. SECY. WARNER

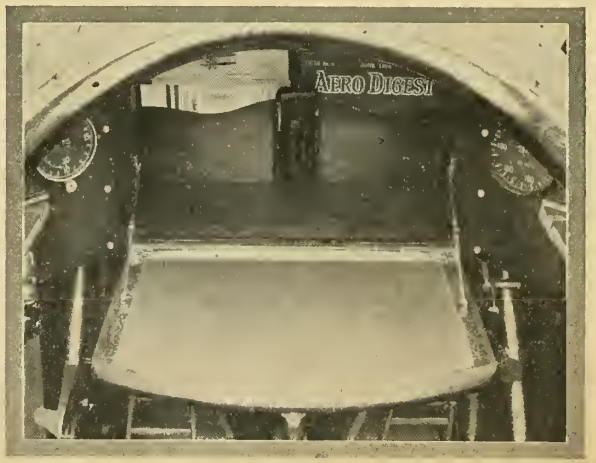
HON. EDWARD P. WARNER, Assistant Secretary of the Navy for Aeronautics, recently accepted delivery of his new "flying office" built for him by the Chance Vought Corporation of Long Island City, New York.

This plane is a practical duplicate of the standard Vought "Corsair" seaplane which holds four world records for speed, and is a part of contracts for 135 such planes which are now being delivered to the U. S. Naval and Marine Corps Air Services by the Vought company. It is powered with a Pratt and Whitney "Wasp" engine.

Except for the special equipment in the rear cockpit for Mr. Warner's use, and the finish of the plane, it is a standard Navy observation-fighter type, and is capable of a high speed of over 160 m.p.h., and a cruising speed of 135 m.p.h.

The plane is probably the most beautiful plane yet produced in this country. The fuselage, struts and landing gear are finished in a beautiful blue. The wings are finished in the natural cream color, and the side fuel tanks, engine cowling, and landing gear wheels are of polished aluminum. On the side of the fuselage is the Secretary's insignia, consisting of an anchor and four stars in blue on a white background.

The rear cockpit is equipped with a folding writing desk. Compartments are provided for materials required, for stowage of reading material, etc. At the side of the cockpit ample compartments are provided for holding brief cases, etc. A large windshield which slides back over the cockpit after the passenger has entered the plane is also provided making the cockpit windproof. Back of the rear cockpit a large baggage compartment is provided for the stowage of four suitcases.



The rear cockpit of the special Vought "Corsair" is equipped with a folding writing desk. Compartments are provided for materials required, for stowage of reading material, etc. At the side of the cockpit there are compartments for holding brief cases, etc.



QUALITY

Quality in an airplane involves a well balanced combination of many intrinsic and distinctive features.

Quality is inherent in all Vought Airplanes, and is the result of many years of selection and development of every characteristic which makes for the supreme in quality.

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CHANCE VOUGHT CORPORATION
LONG ISLAND CITY, NEW YORK

PN-12 ESTABLISHES EIGHT NEW RECORDS

IN the latter part of May, PN-12 No. A-7383 was equipped with direct drive Pratt & Whitney "Hornets" for the first time. After some preliminary flight tests the course of regular type tests was undertaken, during which six world's records and two American records were established. These records were for altitude, speed, range, and endurance, with pay load of one or two tons for Class C-2 seaplanes.

On June 26th Lieutenant Arthur Gavin, U.S.N., reached an altitude of 19,593 feet carrying a pay load of 1,000 kg. (2204 lbs.) exceeding the former world's record held by Switzerland. It is interesting that this record exceeds by 3,000 feet the greatest altitude ever attained by a PN with this load. The following day Lieutenant Gavin, with the same plane, carrying a pay load of 2,000 kg. (4409 lbs.) reached an altitude of 15,426 feet, exceeding the world's record held by France by 59 feet. This record lacked 241 feet of obtaining official recognition as the regulations require that new records exceed the old by 300 feet. This does, however, constitute a new American record for this class.

Lieutenant A. W. Gorton, U. S. N., and Chief Boatswain E. E. Reber, U. S. N., took off with the same plane on July 11th at 4 p. m. carrying in addition to crew, fuel and oil, 2,000 kg. (4409 lbs.) of pay load. Upon landing 16 hours 39 minutes and 51.2 seconds later, they had established five new world's records and one American record.

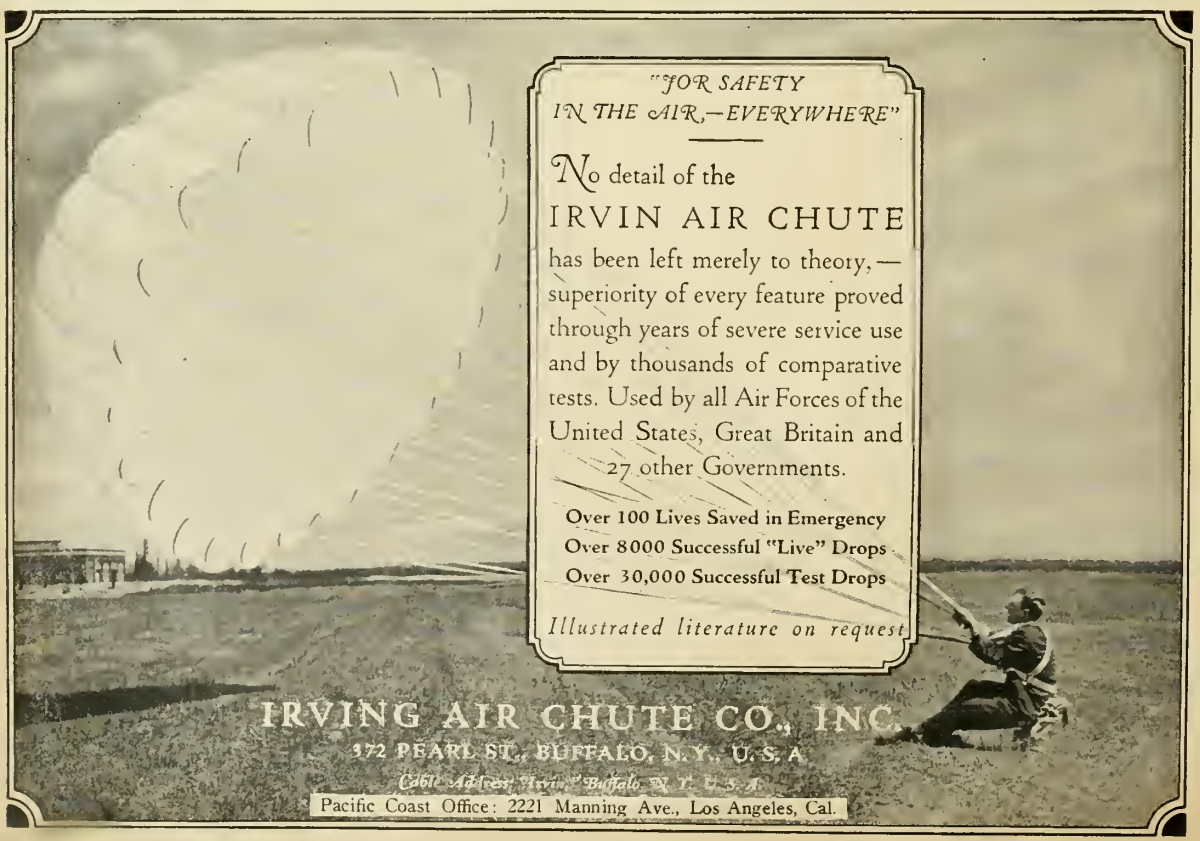
Throughout the gruelling type tests as well as the flights during which the new records were established, the engines performed perfectly without overhauling or adjustment other than routine checking.

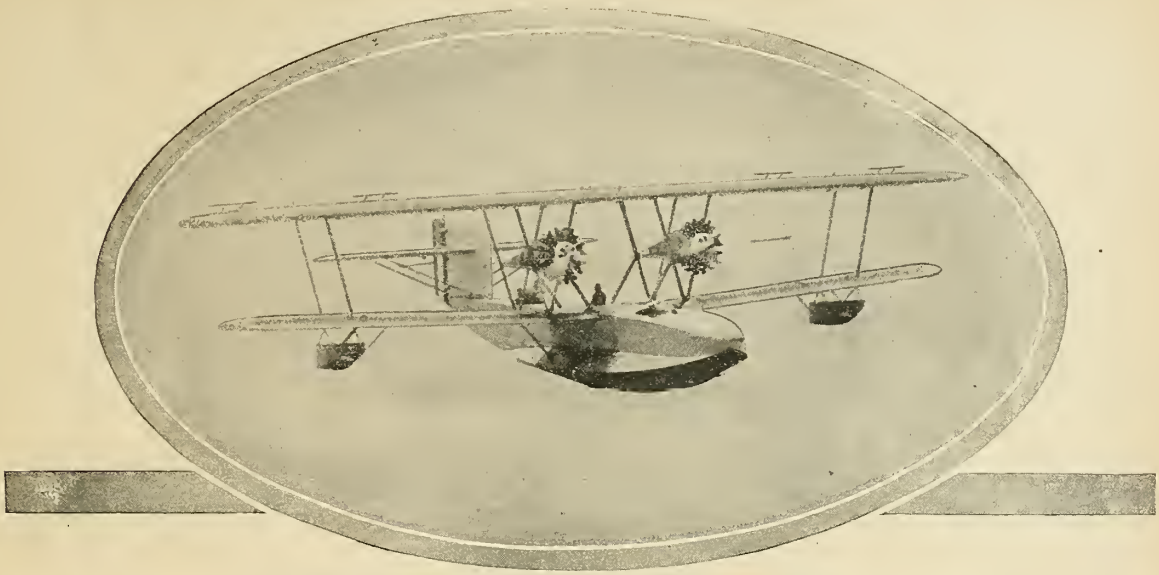
The following table indicates the details of the records made by Lieutenant Gavin, Lieut. Gorton, and Chief Boatswain Reber:

New World's Records	*Former World's Records*
ALTITUDE with pay load of 1,000 kg. (U. S.) Lt. A. Gavin, U.S.N., PN-12—2 Pratt & Whitney "Hornet," 525 h.p. each; at Philadelphia, June 26, 1928; 19,593 ft.	(Switzerland)—Richard Wagner, Dornier-Merkur; B. M. W. 600 h.p. at Altenheim, July 18, 1927; 19,196 ft.
ENDURANCE with 2,000 kg. (U. S.) Lt. A. W. Gorton, U. S. N.; Chief Boatswain E. E. Reber, U. S. N.; PN-12—2 Pratt & Whitney "Hornet" 525 h.p. each; at Philadelphia, July 12, 1928; 16 hours, 39 minutes, 51.2 seconds.	(U. S.)—Lt. B. J. Connell, U. S. N., and S. R. Pope, U. S. N., PN-10—2 Packard 600 h.p. each; at San Diego, Calif. July 8, 1927; 11 hours, 7 minutes, 18 seconds.
RANGE with 2,000 kg. (U. S.) Lt. A. W. Gorton, U. S. N., and Chief Boatswain E. E. Reber, U. S. N., PN-12—2 Pratt & Whitney "Hornet" 525 h.p. each; at Philadelphia, July 12, 1928; 1350 miles.	(U. S.)—Lt. B. J. Connell and Lt. S. R. Pope, U. S. N., PN-10—2 Packard 600 h.p. each; at San Diego, Calif., July 8, 1927; 947 miles.
RANGE with 1,000 kg. (U. S.) Lt. A. W. Gorton, U. S. N., and Chief Boatswain E E. Reber, U. S. N., PN-12—2 Pratt & Whitney "Hornet" 525 h.p. each; at Philadelphia, July 12, 1928; 1350 miles.	(U. S.)—Lt. Z. Soucek, U. S. N., and Lt. L. I. Maxson, U. S. N., PN-12—2 Wright Cyclone, 525 h.p. each; at Philadelphia, June 5, 1928; 1247 miles.
SPEED for 2,000 km. with 2,000 kg. load (U. S.) Lt. A. W. Gorton, U. S. N., and Chief Boatswain E. E. Reber, U. S. N., PN-12—2 Pratt & Whitney "Hornet" 525 h.p. each; at Philadelphia, July 12, 1928; 83 miles per hour.	Never before estahlished.
SPEED for 2,000 km. with 1,000 kg. Lt. A. W. Gorton, U. S. N., and Chief Boatswain, E. E. Reber, U. S. N., PN-12—2 Pratt & Whitney "Hornet" 525 h.p. each; at Philadelphia, July 12, 1928; 83 miles per hour.	Never before established.
New American Records	*Former American Records*
ALTITUDE with 2,000 kg. Lt. A. Gavin, U. S. N., PN-12—2 Pratt & Whitney "Hornet" 525 h.p. each; at Philadelphia, June 27, 1928, 15,426 feet.	(U. S.)—Lt. B. J. Connell, U. S. N., and Lt. H. C. Rodd, U. S. N., PN-10—2 Packard, 600 h.p. each; at San Diego, Calif., August 18, 1927; 6,588 ft. (The present world's record France—15,367 feet).
SPEED for 2,000 km. with 500 kg. Lt. A. W. Gordon, U. S. N., Chief Boatswain E. E. Reber, U. S. N., PN-12—2 Pratt & Whitney "Hornet" 525 h.p. each; at Philadelphia, July 12, 1928; 83 miles per hour.	Lt. B. J. Connell, U. S. N., and Lt. H. C. Rodd, U. S. N., PN-10—2 Packard 600 h.p. each; at San Diego, Calif., Aug. 16, 1927; 78.6 miles per hour.

NEW ARMY AIR CORPS TRAINING CENTER

THE new air corps training center, comprising approximately 2,400 acres, situated about 15 miles northeast from the center of San Antonio, Texas, has been named Randolph Field in honor of Capt. William M. Randolph, A. C., who was killed in an airplane crash at Gorman, Texas, on February 17, 1928.





THE RECORD-BREAKING "HORNET" POWERED PN-12

MORE RECORDS FOR PRATT & WHITNEY ENGINES

It is significant that six new World's records were established when direct drive P. & W. "Hornets" were installed in the Navy's twin-engine PN-12 patrol boat. These records, made during two weeks of test flying, were for altitude, speed, range, and endurance, with pay loads of one and two tons. Previously, various water cooled and air cooled engines had been used in the PN type, but with the "Hornets" it set up an entirely new standard of performance.

On June 26th and 27th, Lieutenant Arthur Gavin, U. S. N., broke one American and one World's record for altitude. Less than two weeks later Lieutenant A. W. Gorton and Chief Boatswain E. E. Reber established one more American and five more World's records for planes of this class. The tests were flown at Philadelphia by Naval Aircraft Factory personnel who are justly proud of the splendid performance of their latest development.

"Hornet" engines are widely used by the Army and Navy, and have flown hundreds of thousands of miles in commercial service. A single transport company has in service or on order a total of more than one hundred of these engines.

THE
PRATT & WHITNEY AIRCRAFT CO.
HARTFORD CONNECTICUT

THE AERONAUTICAL INDUSTRY

U. S. AIRCRAFT INSURANCE GROUP

SOME of the leading American fire and casualty companies have pooled facilities under one management to provide a market for all forms of aviation insurance, underwriting to commence August 1st.

The following companies will constitute the United States Aircraft Insurance Group—each fire company carrying a share of the insurance written on each aircraft while each casualty company will, in turn, carry a share of all liability, accident and compensation risks, accepted by the managers.

The fire companies in the United States Aircraft Insurance Group are: United States Fire Insurance Company, North River Insurance Company, Pacific Fire Insurance Company, National Union Fire Insurance Company.

The casualty companies are: United States Fidelity and Guaranty Company; New Amsterdam Casualty Company; Maryland Casualty Company; New York Indemnity Company.

The United States Aviation Underwriters, Inc., New York City, have been appointed as aviation managers for companies composing the group, and all insurance accepted will be written through the office of this incorporated company. The underwriting will be under the control of David C. Beebe, president of the new company, a former air service pilot, and for the past eight years engaged in insurance business in New York. The technical end of the business will be under the complete control of Reed M. Chambers, vice president of the company, of the first pursuit group, and since that time closely identified with the development of commercial aviation.

Major R. W. Schroeder, former chief test pilot for U. S. Army Air Corps, and later manager of the Ford Air Lines, has been retained in a consulting capacity. Major Schroeder for some years was in charge of the aviation department of the Underwriters laboratories.

Through this system of grouping of companies interested in the various classes of insurance in demand by aircraft manufacturers and owners, protection of any type of risk is available and is secured to the policy holder in companies having an aggregate capital and net surplus of $74,078,333.

This system of grouping of companies has been brought about after careful study of the methods used in the successful handling of aviation insurance in Europe.

Recognizing the growing number of their policy holders who are or will be shortly requiring protection against aircraft risks, these companies after a careful and most comprehensive study of the situation have arranged for the United States Aviation Underwriters, Inc., to assist their agents throughout the United States and Canada in providing the various types of protection in demand. Through the group system, the agent of any one of these companies and the brokers throughout the country have at their command the entire facilities of the group.

NO AIRPORT — NO AIR MAIL ROUTE

CITIES throughout the United States which bring pressure to bear on the Post Office Department in order that they may be included on proposed air mail routes and which do not furnish proper landing fields for the contractors will be excluded from the proposed routes, is the policy of the department made known recently by W. Irving Glover, 2nd Asst. Postmaster General.

AIR MAIL PUBLICITY

HAROLD CRARY, former Middle West and Pacific Coast newspaper man and more recently in charge of national advertising of the Seattle Chamber of Commerce, has opened an office in the Bankers Building, Chicago, as head of the Central Publicity Bureau for air mail members of the American Air Transport Association. Mr. Crary's office will work with all of the air mail company traffic officers and will supplement their sectional efforts with national publicity and releases.

The office will be operated under the direction of a committee consisting of Col. Paul Henderson, Chicago, vice president and manager of the National Air Transport Company; G. S. Childs of the Pitcairn Aviation Company, Philadelphia, and W. G. Herron, vice president of Boeing Air Transport Company of San Francisco.

PHILATELIC NOTICE

THE Hon. P. T. Coolican, Asst. Deputy Postmaster General of Canada, at Ottawa, Canada, is very anxious to build up a mailing list of those in the United States who might be interested in first flight air mail Canadian covers. Mr. Coolican will place any and all of them on his mailing list who drop him a line to that effect, and in that way they will be advised sufficiently in advance of the effective date of any Canadian flights to enable them to forward their covers to the designated offices for special cancellation.

Traffic Agent B. F. Myers of the Post Office Department at Chicago Ill., also very kindly offers to include names of all those who so request on his mailing list; also to assist all our readers in carrying on their first flight air mail work.

NEW AIRLINE ROUTES and SCHEDULES

THE following new airline schedules and changes in schedules have been established since the July issue. A complete list of mail, passenger and express airlines was printed in the December issue. New lines opened since that date or new schedules have been added in each succeeding issue.

Air Mail

C. A. M. 27—BAY CITY, SAGINAW, LANSING, KALAMAZOO, MICH.; DETROIT, ANN ARBOR, JACKSON, BATTLE CREEK, KALAMAZOO, MICH.; MUSKEGON, GRAND RAPIDS, KALAMAZOO, MICH.; KALAMAZOO, MICH., SOUTH BEND, LAPORTE, IND., CHICAGO, ILL.. Operated by the Thompson Aeronautical Corp., Kalamazoo, Mich., and Cleveland, Ohio. (Opened July 17, 1928.)

Time Table

Westbound (Read down)				*Eastbound (Read up)*
4:40 p.m. E.T.	Lv.	Bay City, Mich.	Ar.	11:40 a.m. E.T.
4:50 p.m. E.T.		Saginaw, Mich.		11:30 a.m. E.T.
6:05 p.m. E.T.		Lansing, Mich.		10:40 a.m. E.T.
5:35 p.m. C.T.	Ar.	Kalamazoo, Mich.	Lv.	8:55 a.m. C.T.
Westbound (Read down)				*Eastbound (Read up)*
4:20 p.m. E.T.	Lv.	Detroit, Mich.	Ar.	11:40 a.m. E.T.
4:50 p.m. E.T.		Ann Arbor, Mich.		11:15 a.m. E.T.
5:35 p.m. E.T.		Jackson, Mich.		10:45 a.m. E.T.
6:10 p.m. E.T.		Battle Creek, Mich.		10:15 a.m. E.T.
5:35 p.m. C.T.	Ar.	Kalamazoo, Mich.	Lv.	8:55 a.m. C.T.
Westbound (Read down)				*Eastbound (Read up)*
4:40 p.m. C.T.	Lv.	Muskegon, Mich.	Ar.	9:55 a.m. C.T.
5:00 p.m. C.T.		Grand Rapids, Mich.		9:35 a.m. C.T.
5:35 p.m. C.T.	Ar.	Kalamazoo, Mich.	Lv.	8:55 a.m. C.T.
Westbound (Read down)				*Eastbound (Read up)*
5:40 p.m. C.T.	Lv.	Kalamazoo, Mich.	Ar.	8:50 a.m. C.T.
6:25 p.m. C.T.		South Bend, Ind.		8:10 a.m. C.T.
6:30 p.m. C.T.		LaPorte, Ind.		8:05 a.m. C.T.
7:20 p.m. C.T.	Ar.	Chicago, Ill.	Lv.	7:15 a.m. C.T.

Air Mail—Express

EXTENSION C. A. M. 3—CHICAGO, MOLINE, ILL.; KANSAS CITY, MO.; WICHITA, KANS.; PONCA CITY, TULSA, OKLAHOMA CITY, OKLA.; FORT WORTH, DALLAS, TEXAS. Operated by National Air Transport, Inc. (Stop at Tulsa effective July 5, 1928.)

Time Table

Southbound (Read down)				*Northbound (Read up)*
8:00 p.m.	Lv.	Chicago, Ill.	Ar.	7:00 a.m.
9:50 p.m.		Moline, Ill.		5:10 a.m.
1:10 a.m.		Kansas City, Mo.		1:55 a.m.
3:15 a.m.		Wichita, Kans.		11:40 p.m.
4:10 a.m.		Ponca City, Okla.		10:50 p.m.
5:20 a.m.		Tulsa, Okla.		6:30 p.m.
5:25 a.m.		Oklahoma City, Okla.		9:40 p.m.
7:35 a.m.		Fort Worth, Tex.		7:30 p.m.
8:00 a.m.	Ar.	Dallas, Tex.	Lv.	7:00 p.m.

Air Mail—Express

EXTENSION C. A. M. 18—CHICAGO, ILL.; CEDAR RAPIDS, IA.; DES MOINES, IA.; OMAHA, LINCOLN, NEBR.. Extension of New York—Chicago Overnight service to Lincoln, Nebr., on the schedule below from Chicago. (Effective July 10, 1928.) Operated by Boeing Air Transport, Inc.

Time Table (from Chicago to Lincoln)

Westbound (Read down)				*Eastbound (Read up)*
5:45 a.m.	Lv.	Chicago, Ill.	Ar.	7:30 p.m.
8:00 a.m.		Cedar Rapids, Ia.		5:30 p.m.
9:00 a.m.		Des Moines, Ia.		4:30 p.m.
10:10 a.m.		Omaha, Nebr.		3:15 p.m.
10:45 a.m.	Ar.	Lincoln, Nebr.	Lv.	2:45 p.m.

AIR MAIL CONTRACTS RECENTLY AWARDED

POSTMASTER GENERAL NEW awarded to the Canadian Colonial Airways, Inc., of New York City, the contract for carrying the mails by air from New York City via Albany to Montreal, Canada, one way, at its bid of 96 cents per mile.

The successful contractor already holds a contract from the Canadian government for the southbound trip from Montreal to New York City. Service under the contract, is to be inaugurated within 6 months and is to run for a ten year period. Air mail postage will not be required on this route but regular first-class mail will be carried.

THE Postmaster General also awarded to the Pan-American Airways of New York City the contract for carrying mail by air from Key West, Florida, to the Canal Zone at its bid of $2.00 per mile. This route is 1,640 miles long and provides for stops at Havana, Cuba; Merida, Mexico; Belize, British Honduras; Tegucigalpa, Republic of Honduras; Managua, Nicaragua; San Jose, Costa Rica; and Cristobal, Canal Zone, with service seven times a week. The Postmaster General, under the contract, will reserve the right to include Guatemala and Salvador in the route, and also to extend it southward from the Canal Zone to Cartagena, Colombia; Maracaibo, Venezuela; Curacao, D. W. I.; La Guaira, Venezuela; Port of Spain, Trinidad; Georgetown, British Guiana and Paramaribo, Dutch Guiana, one way three times a week.

The St. Tammany Gulf Coast Airways, Inc., of New Orleans, La., has been awarded the contract for carrying the mails by air from New Orleans via Houston and San Antonio, to Brownsville or Laredo, Texas, at its bid of $1.00 per pound.

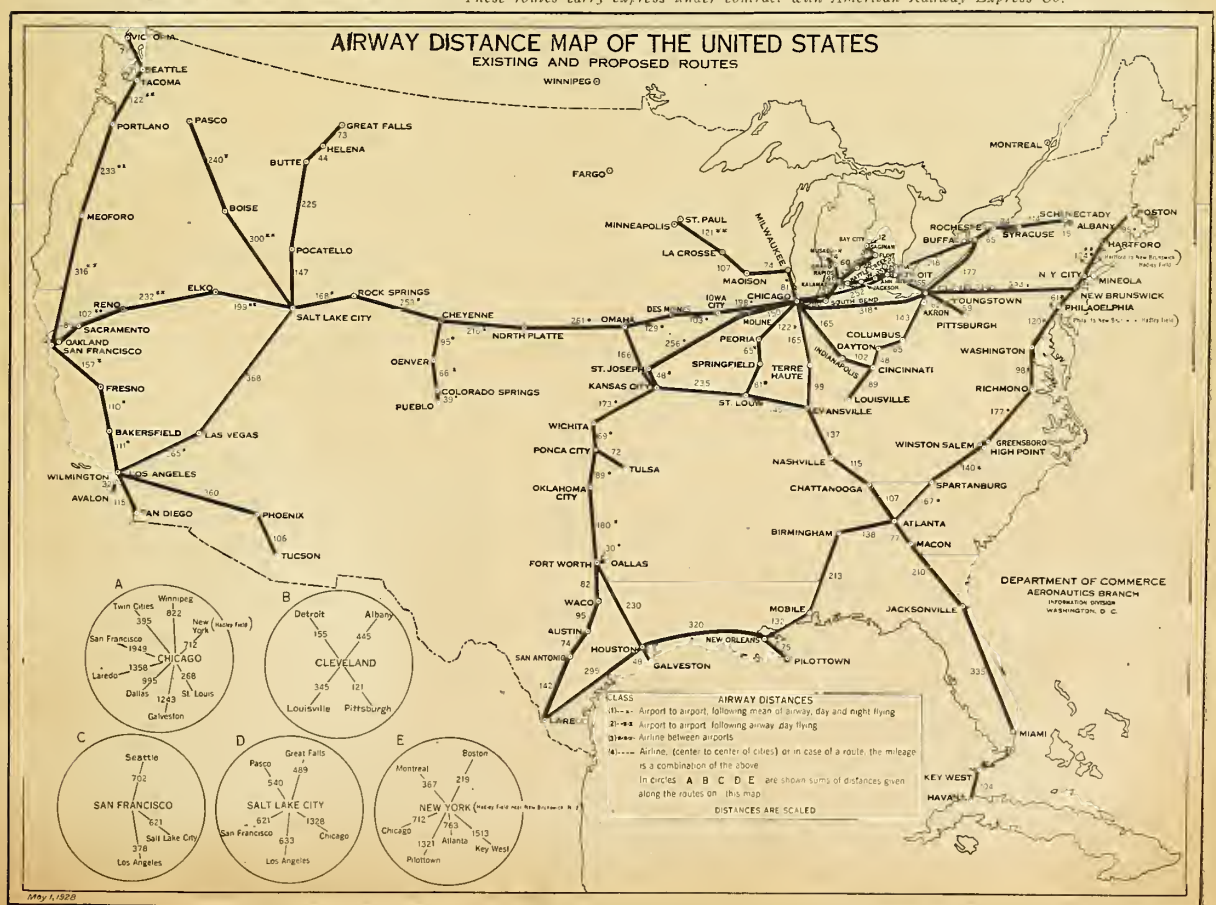
This new service, when inaugurated, will connect with the air mail service to be established by the Mexican government from the American border to the City of Mexico. It will mean a direct mail service by air from Boston, Mass., to Mexico City.

AIR TRANSPORT ROUTES IN THE UNITED STATES

As of July 31, 1928

	Route Mileage	Service Commenced	Latest Schedule	Present Operator	Present Service
CONTRACT AIR MAIL ROUTES IN OPERATION					
Chicago—New York*	723	7/ 1/19	Dly. & Nly.	National Air Transport	MPE
San Francisco—Chicago*	1949	9/ 8/20	Daily	Boeing Air Transport	MPE
Detroit—Cleveland	155	2/15/26	6 days a wk.	Ford Motor Co.	M
Detroit—Chicago	252	2/15/26	6 days a wk.	Ford Motor Co.	M
Salt Lake City—Pasco	540	4/ 6/26	Daily	Walter T. Varney	M
St. Louis—Chicago	268	4/15/26	5 days a wk.	Robertson Aircraft Corp.	M
Los Angeles—S. Lake City*	633	4/17/26	Daily	Western Air Express	MPE
Dallas—Chicago*	995	5/12/26	Daily	National Air Transport	MPE
Pueblo—Cheyenne*	200	5/31/26	Daily	Western Air Express	M
Chicago—Minneapolis/St. Paul*	399	6/ 7/26	5 days a wk.	Northwest Airways	MPE
New York—Boston*	219	7/ 1/26	6 days a wk.	Colonial Air Transport	MPE
Los Angeles—Seattle*	1080	9/15/26	6 days a wk.	Pacific Air Transport	MPE
Pittsburgh—Cleveland	121	4/21/27	Daily	Clifford Ball	M
Cleveland—Albany	443	12/17/27	Daily	Colonial Western Airways	MP
Cincinnati—Chicago*	267	12/17/27	Daily	Embry-Riddle Co.	ME
Kansas City—Chicago*	454	2/ 1/28	Daily	National Air Transport	MPE
San Antonio—Dallas	281	2/ 6/28	Daily	Texas Air Transport	M
Galveston—Dallas	308	2/ 6/28	Daily	Texas Air Transport	M
Atlanta—New York	763	5/ 1/28	Dly. exc. Sun.	Pitcairn Aviation	M
New Orleans—Atlanta	483	5/ 1/28	Dly. exc. Sun.	St. Tammany Gulf C'st Airw'ys	M
Seattle—Victoria	77	10/15/20	Variable	Northwest Air Service	MP
Pilottown—New Orleans	75	4/ 9/23	Variable	New Orleans Air Line	M
Key West—Havana	104	10/28/27	Daily	Pan-American Airways	MP
Wilmington—Avalon	32	3/—/27	Variable	Pacific Marine Airways	PE
Detroit—Buffalo	218	3/28/27	6 days a wk.	Ford Motor Co.	E
Detroit—Cleveland	155	11/ 1/27	Twice daily	Stout Air Services	P
San Diego—Los Angeles	115	11/ 1/27	Daily	Maddux Air Lines	P
Tucson—Los Angeles	440	11/28/27	3 days a wk.	Aero Corp. of Calif.	PE
San Francisco—Portland	549	3/ 5/28	3 days a wk.	West Coast Air Transport Co.	PE
Portland—Seattle	152	3/ 5/28	Twice daily	West Coast Air Transport Co.	PE
Tulsa—Ponca City	72	3/—/28	Twice daily	Blue Bird Airways	P
Tulsa—Wichita	132	4/10/28	Daily	Deluxe Airlines	P
Wichita—Kansas City	173	4/10/28	Daily	Deluxe Airlines	P
Los Angeles—San Francisco	378	4/14/28	Daily	Maddux Air Lines	P
Los Angeles—San Francisco*	378	5/26/28	Daily	Western Air Express	PE
Bay City—Kalamazoo—Chicago	531	7/17/28	Daily	Thompson Aeron. Corp.	M

*These routes carry express under contract with American Railway Express Co.



BALTIMORE AIR NEWS

By Edward Johns

WAR Department officials approved Baltimore's application to extend the bulkhead line at the site of the proposed municipal airport, thereby assuring the city of the right to build the airport.

All objections to the location were withdrawn, including one lodged by the Bureau of Animal Industries, which maintains a quarantine adjacent to the airport. The city will begin work on acquiring the property and placing the bulkhead, and within six months the pumping of dredgings behind the bulkhead is expected to begin.

Baltimore plans a 1,000-acre field, a part of which must be filled, adjacent to present Logan Field. A fund of about $2,000,000 now available, half of the estimated cost, will be used in obtaining property and starting the bulkhead. The site is on the Patapsco River and navigable channels will allow warcraft and freight ships to dock alongside for the purpose of taking on planes.

A BUS-AND-AIRPLANE connection has been announced by Major William D. Tipton, vice president of the Chesapeake Aircraft Company, operating from Logan Field. Arrangements were made by the aircraft concern with the Red Star Motor Coaches, Inc., which serves the Eastern Shore of Maryland, to combine their services so that an airplane will be available whenever a passenger desires to cross the Chesapeake Bay hurriedly.

Maryland is cut in half by the Chesapeake for practically its entire length, with Baltimore on the Western half. It takes two hours to cross the bay by ferry, with long intervals between boats, or nearly seven hours to drive northward around the bay and down to the principal sections of the Eastern Shore. An airplane takes fifteen minutes to cross the bay, including the take-off and landing, therefore such a service is of considerable value. A passenger desiring the air connection merely tells the chauffeur, who arranges with persons already designated to call Logan Field. On being called, an airplane leaves Logan Field and meets the bus.

The same company also has arranged two other services. One is a week-end passenger service to Ocean City, Md., and the other a freight delivery to the Eastern Shore for the May Company, a large department store. Beginning this month, a plane will leave Baltimore each day at 4 p. m. and carry bundles ordered that day by Eastern Shore residents at the store in Baltimore. The bundles will be delivered the same day as ordered.

SEVENTY-FIVE applicants for aircraft operators license have been examined by Dr. H. R. Carroll, of the United States Public Health Department in Baltimore in the past six months. In two months alone he gave sixty examinations, and there still is a number on the waiting list, he said. The rush is due to the operation of the several aero clubs which have sprung into existence, and to the schools at Logan Field, the Pimlico Airport and City Line Flying Service of Baltimore.

LIEUT. CHARLES Y. BANFILL has reported for duty as regular army instructor of the Maryland National Guard Air Corps and to act as air officer of the Third Corps Area. He came from Brooks Field, relieving Capt. Edward C. Black, who was ordered from Baltimore to March Field, San Diego, to organize a bombardment squadron.

THE city of Hagerstown purchased the field used by the Kreider-Reisner Aircraft Company, manufacturer of the Challenger, and is maintaining it as a municipal airport. The field was opened July 4 with ceremonies that included an air meet. It contains sixty acres and is three miles from the city limits.



The Aeromarine Klemm monoplane ready for flight and with wings folded

SIKORSKY AMPHIBIAN CARRIES HIGH LOAD

ON the recent official test at Anacostia, Washington, D. C., the Sikorsky Amphibian S-38, with a normal useful load of 3,200, took off from fresh water in fourteen seconds and from land in eight seconds. No wind was blowing on either trial. Still with full load, one engine cut, the plane had a perceptible climb. The climb to 1,000 feet was accomplished in one minute three seconds. The high speed with two Pratt and Whitney Wasp engines was 129½ miles per hour and the service ceiling 20,000 feet. The cruising speed is 110 miles per hour at 1,650 revolutions per minute.

The plane was originally figured for a useful load of 3,200 lbs. and a gross load of 9,000 lbs. complying with the load factors at that time. Since then, the Department of Commerce, Aeronautics Branch, has issued new requirements for load factors. Under these rulings, the S-38 may have a gross load of 10,400 lbs. and a useful load of 4,200 lbs.

The Model S-38 amphibian is the natural development in the field of amphibian aircraft over the earlier models. It is described in the Technical Section of this issue.

AEROMARINE KLEMM LIGHT PLANE

QUANTITY production of the Aeromarine Klemm monoplane, one of the most popular of the German light planes in this country, was announced in the July issue of Aero Digest.

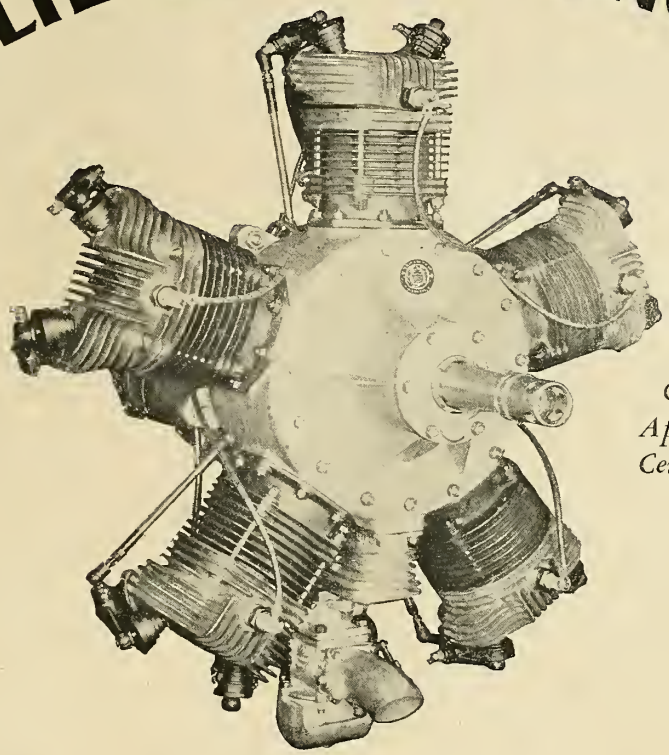
Inglis M. Uppercu, president of the Aeromarine Klemm Corporation, is one of the real pioneers in aviation, for it was in 1908, the year the Wrights astounded the world by their flights at Fort Myer, that the seed of the Aeromarine Company was sown with the formation of the Boland Aeroplane Company of Newark, N. Y., which was financed by Mr. Uppercu.

Mr. Uppercu is one of the few who at that early date saw a future for aircraft manufacture in this country and he is one of the most enthusiastic regarding the future of the industry for a product designed for commercial and pleasure purposes. It is that faith that actuated him in doing laboratory work on land and sea planes, in constructing permanent buildings and the purchase of land sufficient to meet the needs of the future.

The Aeromarine Klemm light plane was developed originally as a glider in Germany. It has been described as a "necessity development" from the restrictions placed on Germany by the Treaty of Versailles. In design it is a low-wing monoplane and can be equipped with either a 20 or 40 h.p. engine. It is a two-place ship and is the standard training plane of many central European countries. Its operating cost is extremely low, and equipped with the 20 h.p. air-cooled engine it will fly 40 miles on a gallon of gasoline. In a recent test it flew for 32 hours and covered a distance of 1,800 miles.

The officers of the Aeromarine Klemm Corporation are: Inglis M. Uppercu, president; Wm. H. Douglas, vice president and general manager; James Wright, treasurer; J. O. Strauss, secretary; Harold Riegelman, attorney; H. Allan Sullivan, distribution manager.

VELIE AIRCRAFT ENGINE



Government Approved Type Certificate No. 4

Quality *First -- to Last*

THE sturdy Velie five-cylinder, radial, aircraft engine is designed, engineered under closest supervision and manufactured to the highest standards of precision.

Only the very best and highest grade materials are used, and the craftsman's finished product must undergo our engineering departments' most rigid inspection and test before delivery is made.

We invite inquiry from airplane manufacturers who realize that the engine is the heart of the airplane.

VELIE MOTORS CORPORATION, *Moline, Illinois*

"Ask the Pilot"

Long Life **VELIE**

OWNED AND OPERATED BY ITS FOUNDER
... 1908-1928 ...

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NEW JERSEY AIR NEWS

By J. B. Bayley

THE Union Airways opened their own airport, Pine Brook, N. J., May 20th, to handle all branches of air service. The company was formed by Barney Newman, veteran flier and is at present using two OX-5 Travel Air biplanes for passenger and general flying with a rebuilt Canuck for instruction. In two months operation they have carried over 650 passengers. Another Travel Air is on order to handle their steadily increasing business.

"Hawk Eye" Talman, of air mail and Gates Circus fame, is chief pilot and instructor, with Lee Mason associate pilot. A level 80-acre field and five-ship hangar completes the equipment.

DUE to the coöperation of city officials and the two flying clubs in Jersey City, that city is soon to have a first class airport. The field is located at Dyers Point, on the Hackensack River, near the city line between Bayonne and Jersey City. At present the runways are about 1500 feet long, but with grading work progressing rapidly they will soon be 2500 feet in the direction of the prevailing winds. There are two hangars, one to accommodate two ships and the other for six.

All work will be completed by the end of July, when the field will be officially dedicated as Potterton Airport in honor of Commissioner Potterton of Public Parks.

The two clubs using the field, Jersey City Aero Club flying an American Eagle and the Jersey City Flying Club owners of a Waco-10, are both using the ships for club instruction. Capt. Bill Dixon, formerly with the R. A. F. in Mesopotamia is instructor for the J. C. F. C. and Dick Stewart, president of the same club, is giving instruction from radio station WAAT, Jersey City, on how to become "airminded."

Teterboro Airport

THIS airport is always the scene of a great deal of activity, with the Wright Service hangar always filled to overflowing with Whirlwind ships in for overhauling. It is believed that every type of Whirlwind ship in the country has at some time or other dropped in for service. Just recently we found the Byrd's Antarctic Ford, and Chamberlin's Sperry Messenger, parked wing under wing. The *Columbia,* of transatlantic fame, was in for a top overhaul and fuel tests.

Then we have the big factory of the Atlantic Aircraft Corp. on one side of the field. They have recently added a large steel hangar, serving as additional assembly space and for housing the finished ships before shipment. Hughie Wells, ex P.A.T. and Colonial, is doing the test work. From the way orders are piling up he will be a busy man for many months.

The fifth ship of a fleet of six F VII trimotors for the Marine Corps was delivered just before going to press. Another interesting order was recently executed with the delivery of six convertible Super-Universals to the Northern Aerial Mineral Survey, Ltd., of Canada, who will use them as land and seaplanes to explore the vast undeveloped sections of northern Canada.

The first of an order for four Fokker Super-Universal monoplanes has been delivered to National Parks Airways, Inc., of Salt Lake City, Utah. It was piloted by Arthur W. Stephenson, accompanied by A. E. Everett, field manager of the National Parks airport at Salt Lake City.

A new plane was added to the aircraft equipment of the Richard E. Byrd Antarctic expedition when a Fokker Super-Universal left the Teterboro Airport June 23rd, on a 10,000-mile tour of the United States and Mexico. This trip is to condition and test the ship. The ship was piloted by Grissom E. Haynes and George Conklin accompanied him.

Last but not least, Gates Flying Circus make this field their headquarters. They have been using three Hisso Standards for the passenger business, carrying about 2,500 passengers since the first of the year. Forty-six students are enrolled for the ten-hour course. Aron F. (Diablo) Krantz, well known for his barnstorming proclivities, has been recalled from the "road gang" to take active charge of Gates activities in the north. Jess Menefee is chief pilot and instructor; with Holmes (Texas) Sakler, assisting in the passenger business.

Major William Brooks, former Chief of the Nicaragua Air Service, has been appointed as general manager in charge of the operations of the circus on tour. Lee R. Cain has been appointed assistant general manager. Pilots include Okey Bevins, Chester D. Vogt, and Homer Fackler.

Clyde E. Pangborn, formerly in charge of the road outfit, is now in Paterson as test pilot for the Gates-Day Aircraft Corporation, manufacturers of the New Sandard planes.

DREWS BROS. are now operating the Paramus Airport about one-half mile north of Ridgewood. They are using three ships at present, a Waco-10, rebuilt Jenny for instruction and Swallow for photography. Their field is well located with clear approaches on three sides and two well graded runways 2,000 by 2,200 feet. They report a good business in all lines.

JOSEPH FERRARO, automobile dealer of Dover, has purchased a new Challenger from Gates Aircraft, north Jersey dealers for this ship, and expects to do a large passenger carrying business from Lake Hopatcong, this summer. Cyrille Peabody is piloting for Ferraro.

MAYOR THOMAS L. RAYMOND has announced that the first unit of the Newark Airport will be completed on August 1. The total cost of the airport will be $6,000,000, of which $1,000,000 has already been spent. The airport covers about 350 acres and will have two runways in the prevailing winds, 800 feet wide and 2,200 feet long.

REICH AIR TRANSPORT, organized some months ago by Fred Reich, is doing a big instruction business, 143 students being enrolled at the present time, with numerous clubs also taking instruction. They are using the old North Elizabeth Airport in back of the Durant factory on Frelinghuysen avenue, near the Newark line. The field is about 1,600 feet square, with good approach from all directions. Four Waco-10s are used. Capt. Bill Dickenson, world war flier with eight of our late enemies to his credit, is chief pilot and Billie Highes, assistant instructor.

A NEW company was formed during June to promote sight-seeing over New York City; it is known as the New York Airways, Inc. F. Hamilton is president and D. D. Johnston, chief pilot. A new trimotor FVII Fokker provides the passengers with all of the comforts of a pullman during the twenty minutes around a triangular course from the Teterboro Airport to the Statue of Liberty, up Broadway to 125th Street and back to Teterboro.

ASA E. REMOND, late of the Gates Circus and points south, has been flying with Dick Stoddart of Jersey City, who recently purchased a new Travel Air biplane.

For the past month they have been operating from the municipal airport at Poughkeepsie, carrying 563 passengers in that time. The ship has just been flown back to the Pine Brook Airport where they are servicing it preparatory to a long tour of the west. Johnny Runger, parachute jumper and mechanic, will form the third member of the party.

THE BELL Telephone Laboratory at Whippany, N. J., has undertaken the problems of regular telephone service between any point on land and an airplane in flight, at the same time working out some system of radio navigation of a plane in thick weather. For this purpose they have equipped a standard Fairchild plane as an electrical flying laboratory. Capt. A. R. Brooks, ex-U. S. A. instructor and graduate of M. I. T. class of 1917 is doing the piloting. E. L. Nelson, of the Operations Development Laboratory and former experimenter in radio-aviation work for the Navy, has charge of the experiments.

THE GREENACRES AIRPORT CO. of New York City has recently opened two new ports in New Jersey. One tract of 103 acres is at Mendham on the High Bridge Road and the other at Lyons of 294 acres. Both airports are being operated by the same company which was formed by George H. Hull and Fred C. Schley. At present a Challenger and Jenny are being used from Lyons with a Waco-10 at Mendham, for passenger and instruction work.

AT Arcola Airport, Hackensack, the usual brisk business is being handled by Fred Trautwein, American Eagle dealer. In the past two months 837 passengers were carried and a peek at the books showed 28 students enrolled for the ten-hour course. Two old timers are doing the piloting and instruction, William Diehl and Ives McKinney of barnstorming and air mail fame.

(Continued on next page)



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(New Jersey News continued)

ADDITIONAL aerial identification will be provided at Morristown and Newark by the erection of Aerovanes. Six of these markers will be erected in the former town with nine in and about Newark, giving wind direction, compass bearing and name of the community. At the same time the Chamber of Commerce of the Oranges announced that they will paint the names of the respective cities on several roofs in each of the Oranges and Maplewood.

JEROME BRADY of Bayonne recently bought a Travel Air biplane with Siemens-Halske engine, from Ken Unger state distributor. This plane is being used to facilitate the inspection of his four ice storage plants at Lake Hopatcong, Pocono Lakes, Johnsville, Pa. and Bayonne. Brady does his own piloting, having received his instruction while in the experimental section of the Navy. He will shortly add a cabin Travel Air with Whirlwind motor.

Brady has opened his new airport at Lake Hopatcong. This port has been put in excellent condition.

J. BROWNLEY is operating from the old flying field at Springfield using a Waco-9. As the field is about a half mile from the main highway, it has taken a lot of local advertising to build up his business.

CHARLIE (Slim) WEST has organized the Pioneer Airport in East Paterson, on Market Street, with a Pitcairn Fleetwing and rebuilt Jenny. West is doing all of the piloting and instruction work as well as acting as a rigger in all repair work.

ABOUT a mile down the road Joe James, with a Hisso Travel Air monoplane, is taking them "high wide and handsome," for a consideration. Sometimes we wonder where all of the business comes from!

KEN UNGER has established the Unger Aircraft at Madison, N. J., with the state agency for the Travel Air line. In the past four months he has sold twenty Travel Airs, has soloed seventeen students and has about twice that number enrolled for the ten-hour course.

THE Aero Club of Atlantic City has appointed a committee of three of its members to work with the Crescent Air Service, Inc., operators at Bader Field, on plans for flying instruction courses for club members.

The Crescent company purchased a 52 by 80-foot all-steel Esline hangar, during May, from the Esline Company of Milwaukee, to accommodate the company's planes at Bader Field.

THE North Jersey Flying Club with headquarters in Union City, N. J., has purchased an improved Alexander Eaglerock for the use of the club's members.

Instruction in flying will be given the members by Lieuts. Frank J. Bennett and John L. Wilson, former army pilots, and will continue throughout the summer and fall seasons. Ground school lectures are also given at the club's weekly meetings.

HAVING outgrown their first factory, the Canvas-Leather Specialty Company of Trenton, New Jersey, has moved to a modern three story brick factory in that city.

This company, while fulfilling government contracts for some time, did not begin its appeal to the civilian trade until last year. It manufactures a line of flying clothes known under the trade name of "Snappy-Snug" which are handled both through dealers and direct to the customer.

The increase in business from the civilian field and the fact that the company has been awarded the bids on a large number of both army and navy contracts, has necessitated this expansion.

DELAWARE AIR NEWS

By Ray Krimm

HENRY BELIN DU PONT, treasurer of the E. I. duPont deNemours Company, powder manufacturers, and director of duPont Field, a private airport near Wilmington, has purchased one of the new Pitcairn Sport Mailwings, equipped with a Wright Whirlwind engine.

Mr. duPont's plane is specially constructed so that only a small compartment is left for baggage, the gasoline tank taking up most of the room. The plane can accommodate only the pilot. It will carry sufficient gasoline to make a flight of approximately 1,000 miles.

DU PONT FIELD, at Wilmington, the private airport of Henry B. duPont, is being equipped for night flying operations. Mr. duPont has purchased a floodlight, a flashing beacon, boundary lights, approach lights and obstacle lights from the B. B. T. Corporation of America, airport lighting specialists.

PENNSYLVANIA NEWS

THE distinction of having the first insurance window in the United States with the words "Aviation Insurance" displayed as part of the window sign, goes to the Philadelphia department of the Independence Fire Insurance Company.

The Independence Companies were pioneers in this form of insurance, having announced their "All-In-One" comprehensive aviation coverage in July, 1926. Their list of aircraft policy-holders constitutes a "Who's Who" in American aviation activities. Col. Charles A. Lindbergh's new Curtiss-Robin, has been insured by the Independence Companies of Philadelphia and underwritten by Barber & Baldwin, Inc., of New York. Colonel Lindbergh's world-famous "We" was likewise insured by them.

In addition to the insurance carried by Colonel Lindbergh, policies have been issued to the following:

Major James Fitzmaurice, Emilio Carranza, United Cigar Stores Co., Royal Typewriter Co., Universal Motion Picture Corp., Fox Film Corp., and such leaders in aircraft activities as Boeing Air Transport, Inc., National Air Transport, Inc., Colonial Air Transport, Inc., Western Air Express, Inc., Robertson Aircraft Corp., Colorado Airways, Inc., American Railway Express, Ford Motor Co., and many others.

MORE than 100 Pittsburgh business and industrial leaders left Pittsburgh on a special train on July 12 for a three-day visit to the flying fields and aircraft factories of New York and Long Island. The trip was made in the interest of Pittsburgh's planned airport and of making Pittsburgh a center for airplane manufacture. Copies of Aero Digest were distributed on the special train which brought the party to New York.

Pennsylvania Air Rules

LOW flying over towns, cities, and crowds will be prohibited under the new rules governing aeronautics in Pennsylvania, which have been adopted by the State Aeronautics Commission.

Airplanes may not come below 1,000 feet over congested towns and cities and in the rural sections they are required to stay above 500 feet, exclusive of landing and taking-off. Flights at less than 1,000 feet may not be made over a crowd.

The commission provides for four classes of pilots and demands the licensing of airports and landing fields in its regulations, designed to increase the safety of flying, which became effective July 1.

Acrobatic flying is prohibited over towns and cities at less than 1,000 feet and over civil airways stunt fliers must remain above 2,000 feet. Aviators carrying passengers for hire are not allowed to stunt. Except when it is necessary for the safety of passengers or the pilot, the dropping of any objects from an aircraft is prohibited. The transportation of explosives also is banned, except when it is necessary for signalling, unless special permits are granted by the Secretary of Internal Affairs.

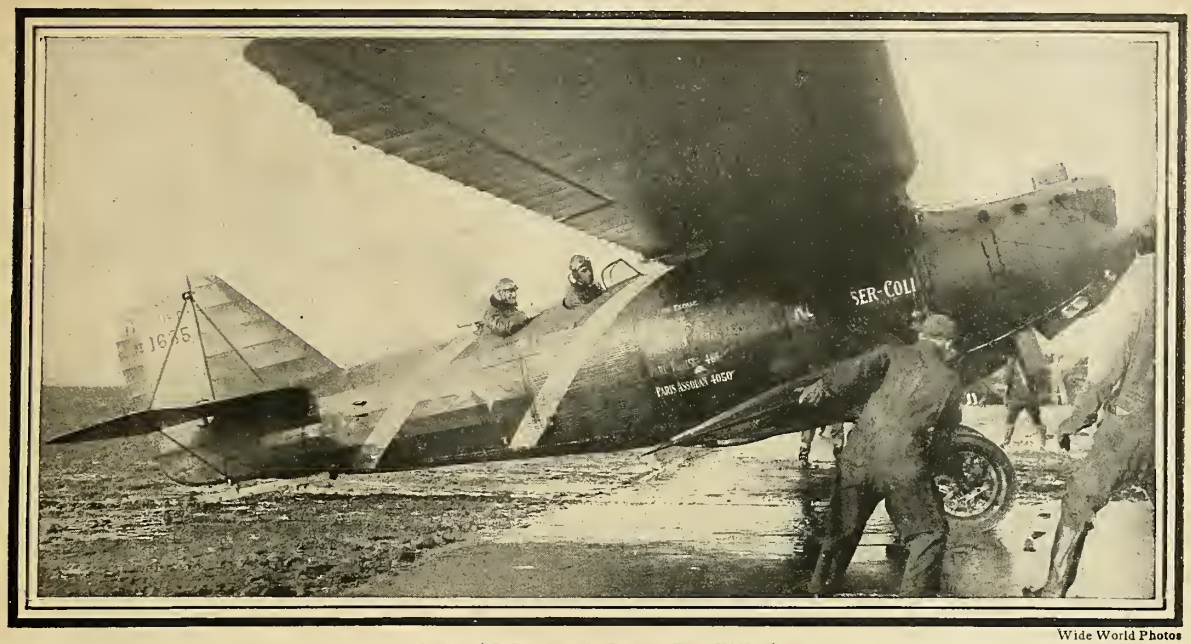
Learners' permits for student fliers will be granted for a period of ninety days and none will be granted to those under sixteen years of age. These permits are to be granted only after the applicant has passed the physical examination prescribed by the Department of Internal Affairs.

The four classes of pilots' licenses are: transport pilot, requiring at least 200 hours of solo flying; limited commercial pilot, requiring at least 200 hours of solo flying but in a limited flying area; industrial pilot, requiring at least 500 hours of solo flying; private pilot, requiring at least ten hours of solo flying.

Transport pilots may fly aircraft carrying passengers or property for hire and are the only pilots permitted to instruct students. Limited commercial pilots may operate commercial planes in limited districts. Private pilots cannot transport passengers or freight nor instruct students for pay.

The commission has designated two classes of mechanics. These are engine mechanics and airplane mechanics. Mechanics attempting to repair planes and not holding a Pennsylvania license are liable to a fine.

Airports and landing fields will be licensed according to equipment, size and night flying facilities. All aircraft must have painted on the fuselage the Pennsylvania license number preceded by the letter "P" enclosed in a keystone.



Wide World Photos

Costes and LeBrix in their Breguet, Type XIX, plane.

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TOKYO to Hanoi, 2,500 miles, the longest non-stop flight in the Far East was made by Costes and LeBrix on their round-the-world trip. They made it on Socony Aviation Gasoline.

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AVIATION GASOLINE—AIRCRAFT OIL

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NEW ENGLAND NEWS

By George W. Hamblin

WE witnessed the expenditure of twenty thousand dollars of the tax-payers' money in an attempt to "entertain" Bill Stultz, Slim Gordon and Amelia Earhart. We may not know a whole lot about receptions, but we're here to state that it must he an awful strain on the boys and girls who might happen to fly an ocean to have to sit and hear the same old line of drivel for a couple of hours. Slim Gordon told the writer that he'd appreciate it a whole lot more if the money was spent on the orphan airport that sits on the marshes at Jefferies Point, and give the people of Boston something to cheer about.

YES, gentle reader, we have advanced one inch toward getting an airport for ourselves, and it does look as though we'll soon get an airport. Mayor Nichols has signed the lease of the airport from the State. The Army is moving down to the southeastern corner of the present filled area, regardless of what the city of Boston does, and will have their hangars taken down after September first. That will eliminate one hazard from the present field.

Through the courtesy of Mr. Chandler Hovey, Boston broker, we have had the north and south runway at Boston lengthened to 2,100 feet, a B. B. T. floodlight installed and now we are assuming the importance of an airport.

THE Boston Airport Corp. comes to bat with several news items of importance, the first of which is the washing out of OXX motored ships as flying school planes. The new era ushers in Whirlwind engines in Travel Airs for student instruction.

Next we had two carloads of OXX Travel Airs delivered. One carload of four was set up by the O'Toole brothers, Walter and Johnnie, who are the works in the Beacon Air Service. The other four planes were flown in from Wichita by Capt. C. E. Hodge and Lieut. Bob Nagle of Boston, Charlie Landers and A. J. Wadlow of Wichita.

Then there is the new Fairchild monoplane being set up on pontoons for work along the coast summer resorts.

Next is the re-opening of the Nantucket Air Line. Trips are made down on Fridays, and back on the following Mondays. Lieut. Ralph T. Wickford is the pilot, and he flies his sweetheart, the Stinson "Miss Nantucket" on the run. Mechanic Bob McCurdy is down on the island keeping the ship percolating, and William "Down Wind," also "Moth," Eaton is also down there taking care of the business end of it.

Operations Manager B. F. Billings will leave for Detroit August first to get the whys and wherefores of the corporation's new Ford trimotor to be delivered September 1.

The Whirlwind Travel Air that won the Ford Reliability Tour in 1926 has been rebuilt, and is struting its stuff as of old. Fred Ames' old Whirlwind job has also been rebuilt, and has the pilot's seat in front, with provisions for photographic work from the rear cockpit, student instruction, and what not.



Capt. LeRoy "BonBon" De Arce

All in all, the old Airport Corp. is still showing the youngsters how it is done. And I almost forgot to state that Emerson Carpenter has received his transport license, and August O. Pabst has been appointed assistant to Billings. Frank Le Man, of Hudson Airways fame back in twenty-one or so, flying MF and HS boats, is now traffic sales manager.

DOWN in Revere, on Squire Road, is a gang of boys who are beginning to go places and do things. We are referring to the Old Colony Airways Corp. Capt. LeRoy Pon Ton deArce, whose smiling face beams on you from this page, is chief pilot for Old Colony, and here's the rest of the personnel: Edmund F. Fischer, president; E. J. Radasch, Jr., vice president and treasurer, Capt. de Arce, chief pilot, Mike Harlow, pilot, and Johnnie Polando, chief of maintenance.

Old Colony has two Eaglerocks and a Ryan Brougham on the line. They are dealers for eastern Massachusetts for these two ships. New hangars are being erected on the airport and a north and south runway is being surveyed.

TOM CROCE, the last of the old fashioned barnstormers around Boston, has hung his "Canoriole" and "Roumanian Hearse" and "Avrox" up for keeps, and has bought him a Challenger.

W. A. "BILL" WARWICK, of M. I. T. Flying Club, and his wife, Dorothy, the first girl to go solo at the airport here, have left for Bill's home in Flint, Mich., where, with Cobham Noyes and John Ivanoff, they will organize Skyways Inc. of Michigan. Bill expects to have Stearmans and Challengers on the line, and has a Warner engine due for delivery about August 1. The Warner will be installed in a Challenger and then entered in the coast-to-coast air race in conjunction with the National Air Races at Los Angeles.

SKYWAYS, INC., has come along fast since they began operations. Two Challengers and a Stearman are being operated, and two Monocoupes have recently been flown in for demonstration purposes. Crocker Snow, Ted Kenyon, Charlie Emerson and Olcott Payson are the pilots, George "Mike" Barry and Danny Duggan are the ballyhoo artists. Then there's Bob Fuller, who acts as general handy man around the ships, and Mr. Townsend, who is the works in the Copley-Plaza office of the company.

Skyways has opened two fields, one in Lawrence and the other in Wareham, down on the Cape. Business at both fields has been good. Payson flies at Lawrence and Emerson at Wareham.

Who's Who at Muller Field

THIS month we will break away from Boston, and hop down to Revere, where we find our old friend Bon Bon de Arce strutting his stuff for the Old Colony Airways Corp. Bon Bon has again got the chance to show his swell clothes, because the company has recently purchased a Ryan Brougham. This boy de Arce, you know, is the flying Beau Brummel—the example par excellence of what the well-dressed pilot will wear. Anyway, with the help of a little Old Crow, we finally got a story out of him, and you can have it as Bon Bon gave it to me.

Capt. de Arce says he was born in the month of March, but he has forgotten the year. He was educated at St. Josephs Academy and the Sacred Heart College, San Francisco, Calif. Next came Ground School in 1917, at the University of California, and the Fourth Class claimed him for its own.

After struggling through ground school, Bon Bon went to Wilbur Wright Field, where he soloed without busting his right eyebrow. Then came Ellington Field, Houston, Texas, and Tolliver Field, where he was taught aerial gunnery. Then the Big Event—over the bounding seas, and de Arce says they never bounded so much before, to France. He returned to America in 1919, when he was demobilized, much to the relief of the ossifiers higher up.

Going home to California, Bon Bon flew a bit for the movies, and then commercial flying palled on him, so he re-enlisted in the Air Service. An advanced course at Kelly Field was next in order, in 1922. In 1923 he resigned and joined the reserves, with the rank of Captain. Jennies weren't enough for this boy, so he took himself down to Texas, where he went into the cattle business, and had more trouble trying to make a steer behave than he did the balkiest Jenny. Did a bit of flying with the reserves down there, and then the old urge to get back into harness blasted him loose from the Lone Star State, and he blew into New York in 1926, just when Colonial Air Transport was opening up the Boston-New York night mail run. He flew the first trimotor Fokker on the night run, and served Colonial faithfully for two years.

Now Capt. Le Roy Pon Ton "Bon Bon" de Arce (yes, that's all his) is manager mit operazions for de Old Colony Airwaz at Rewere—mit helmit and giggles, too.

There you have it, gentle and perspiring reader, that's all the dirt about this rather colorful young man who has the long moniker. And, before we close, may we say, in all seriousness, that they don't come any better than this lad de Arce.

(*Continued on next page*)

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Say you saw it in AERO DIGEST

(New England News continued)

HAVING received their first Lincoln-Page, the Pilgrim Air Service, Inc., has begun operations. They intend to operate from the Boston Airport and are also looking for a field out of town, that being the favorite habit of the boys in these parts right now. Last month we gave the names of two of the boys in Pilgrim, and now we will let you have the whole works. Albert J. Anderson is president of the corporation, Francis B. Masterson is vice president, Louis C. Billotte is treasurer and Joseph A. Dunn is secretary. Lieut. Stanley E. Beck, of the 101st Observation Squadron, M. N. G., is chief pilot.

THE BAY STATE Flying Service, having demonstrated their Meteorplane at both the Lowell and Springfield Air Meets, are having it set up down at Muller Field, as we are writing this, and Lieut. Adolph M. Backstrom, chief pilot for the company is expected to test-hop it in a few days.

Fred Pereira keeps on signing up students —he has seventy-five students on the books now.

Two Hisso American Eagles are on their way, one for the Bay State and the other for the Amesbury Airways.

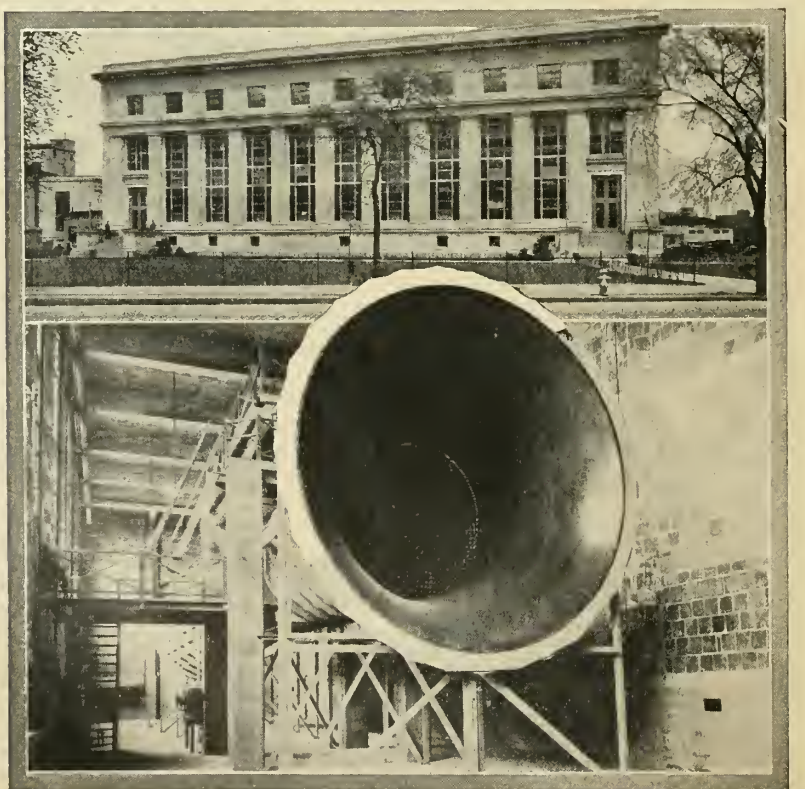
ELLIOT ROLLINS dropped in the other day to tell us what he is doing down on Prior's Airport at South Easton. The airport is located six miles north of Taunton, on the main road to Bridgeport and the Cape. Rollins Aerial Service is composed of Elliot Rollins, president, William Renard, field director and Dick Engel, chief pilot. Lieut. Leo Tracey was flying instructor until he signed up with the Springfield Airport bunch so now Engel takes care of the whole thing himself. The company is dealer for Eaglerock and Ryan planes for the Cape Cod district.

THE Third Annual New England Aviation Exposition will be held at the Mechanics Building, Boston, October 1-6.

The exposition is under the direction of Daniel Rochford, aviation editor of the *Boston Evening Transcript,* who directed the New England Aviation Expositions in Boston in 1925 and 1927.

As in 1927 the exposition will be held in conjunction with the annual Boston Radio Show directed by Sheldon H. Fairbanks. The two shows are in separate though adjoining halls and one ticket admits to both.

The Advisory Committee of the exposition consists of: Gov. Ralph O. Brewster of Maine; Gov. Huntley N. Spaulding of New Hampshire; Gov. John E. Weeks of Vermont; Gov. Alvan T. Fuller of Massachusetts; Gov. John H. Trumbull of Connecticut; Gov. Norman E. Case of Rhode Island; Asst. Sec. of the Navy Edward P. Warner; Porter Adams, National Aeronautic Association; Maj. Gen. John F. O'Ryan, Colonial Air Transport, Inc.; Maj. Gen. Preston Brown, U. S. A., commanding First Corps Area; Rear Adm. Philip Andrews, U. S. N., commanding First Naval District.



The Daniel Guggenheim Aeronautical Laboratory of Massachusetts Institute of Technology. The lower view shows one of the wind tunnels.

SPRINGFIELD NOTES

By Henry P. Lewis

THREE good sized landing fields are now in daily use in Springfield and a fourth is projected to be ready by next spring. The fourth field is being developed under the guidance of Congressman Henry L. Bowles and public spirited citizens.

NORTHEAST AIRWAYS, INC., has taken over the planes and business of the Springfield Airlines, Inc., and Harry Hermann, chief pilot, continues as president of the new company. Swallow airplanes are distributed by the concern in New England and the company is also handling American Eagles and Challengers in this vicinity.

SPRINGFIELD'S three entries in the national model airplane contest held at Detroit in conjunction with the Air Olympics brought home medals. One of them also brought home a check as winner of sixth place in the scale model contest and a scale model entered by a fourth Springfield boy won third place which carried with it a gold medal and a substantial check.

Interest in model airplane building and flying is to be fostered throughout the year and plans are already in process of formation for the organization of classes in aerodynamic theory and practice, airplane design and construction. The classes will be conducted by your correspondent who directed the Springfield model airplane contest and is a reserve Naval aviator.

Springfield Air Pageant

SIMPLE, yet impressive ceremony marked the formal dedication of the newly developed Springfield Airport at Fisk Park, June 30. The five-day pageant was staged under the auspices of the Springfield Aerial Pageant Company, and the Springfield Airport, Inc.

There was a crowded program of speed, obstacle and relay races, balloon bursting, bomb dropping and stunting.

Connecticut's flying governor, John H. Trumbull, paid a flying visit to assist in the dedication. Attorney Thos. P. Shea, past commander of Springfield Legion, was chairman. Dr. Wm. A. R. Chapin gave the dedicatory address.

The pilots and ships at the airport were: George J. Haven and Albert Sesjardins of Worcester, Waco; James A. Hearn and Leonard Povey of Springfield, Eaglerock; Capt. Earl W. Fleet of Hartford, Army O-11; Lieut. Harry Copland, Consolidated; J. J. Rogerson and W. H. Collins, Springfield, Ryan Brougham; Joseph Lyman and Joseph Ballum, Northampton, Eaglerock; Samuel and George Rowlandson, Lowell, Waco; Gordon K. Berry, Worcester, Waco; State Inspector Robert L. O'Brien of Boston and Federal Inspector Winthrop Sargeant, Holyoke, Fairchild cabin plane; George K. Wilson, Manchester, Waco; Howell Bayles, Pittsfield, Command-Aire; Lieut. F. C. Wolfe, Mitchel Field, O1-B; Lewis J. Davis, Hartford, Travel Air; Lieut. B. J. Peaslee of Mitchel Field, O1-B; Lincoln B. Field and Charles P. O'Connor, Northampton, Eaglerock.



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FLORIDA AIR NEWS

By Johnson Wright

VERN SPEICH, vice president of the Zenith Aircraft Corporation, landed his International F-17 on the 54th Street airport on July 8th completing a 3,670-mile air trip from Newport Beach, California. The total flying time for the trip was 39 hours 5 minutes. Speich, a member of the Elks Lodge of Riverside, Cal., flew to Miami to attend the Elks national convention. This ship is the first International in this part of the state and it has been admired by many.

Among those who flew to Miami for the Elks national convention were Johnny Green of St. Petersburg, who arrived in his Eagle-rock and George Alrich, who came in from Lake Worth in his Seagull.

THE St. Augustine airport should be ready for use by August 1st according to reports just received. The securing of a modern airport for St. Augustine is mostly due to the work done by the Junior Chamber of Commerce.

Efforts are being made by the Gainesville Chamber of Commerce to have the Board of Control of State Lands deed to the city a section of the Florida Farm Colony near the city for an airport. A petition has been prepared and will be presented to the board at its next meeting at Tallahassee.

GLENN H. CURTISS, pioneer aviator and founder of the Curtiss Company, has announced plans for the construction of a new one-wheel amphibian. The design is covered by a patent Mr. Curtiss secured before the war.

Mr. Curtiss advised that the new ship will resemble the Seagull, will accommodate three passengers and pilot, and will be powered with a 170 h.p. radial engine. The first ship will be built by the Curtiss Company on Long Island but subsequent ones will be manufactured in Miami according to present plans.

ST. AUGUSTINE will soon have a modern, standard airport. The Junior Chamber of Commerce is carrying out a plan that is indeed a good one. A site 2½ miles southwest of the heart of the city has been secured together with considerable adjoining land. 132 acres have been set aside for the airport and the surrounding land divided into small parcels which are being sold for a sum sufficient to cover the cost of the land and preparation of the port together with the purchase of the necessary equipment.

THE Florida Flying School, Coral Gables Airport, was organized June 11th by Ben Jones, Ernest Robinson, and S. A. Shoumaker. The school got away to a good start with twelve active students enrolled the first two weeks. Robinson, who is chief instructor, is a former R.A.F. pilot and is very popular with the students and pilots.

The same organization has the Waco distributorship for Southeastern Florida.

THE Moore Aero Supply Company has recently added an engine test stand. This company is now equipped to furnish anything in the nature of repairs or overhaul of aircraft and engines in the Miami district.

THE Waco seaplane of the Chalk School of Aviation is again in the air after a complete overhaul and repainting at the Moore Aero Supply Co. The fuselage is painted a dark blue while the wings are finished in a Chinese yellow.

ANOTHER attempt at emulating bird flight failed when Capt. George White's ornithopter crashed on St. Augustine Beach while attempting a flight during the afternoon of June 16th. Capt. White was unhurt and reported shortly after that he would return to Stony Brook, Long Island, and build another.

WORK on the new 130-acre airport of the Pan American Airways at Miami is progressing rapidly and should be ready for use before the middle of August. The Pan American leased the field with an option to buy and their plans call for an expenditure of approximately $50,000 in preparing the field and the construction of hangars and other buildings. Capt. J. E. Whitbeck, airport engineer, is in charge.

NEW ORLEANS NEWS

By Harold A. Dempsey

THE formal opening of the Menefee airport was celebrated by an elaborate air fête attended by some 10,000 people. The new port gives New Orleans a flying field within a few minutes ride of the heart of the city and its opening was featured by airplane maneuvers, stunt flying and safety demonstrations.

Many planes from various sections of the south were on hand to help in celebrating the opening of the new field. Three ships came from Fort Crockett at Galveston, Texas, and represents the third attack group of the United States army. Lieut. E. C. Robbins was in command of the flight and others making up the party were: Capt. C. E. Brenn of the medical corps, Lieuts. J. L. Hitchings, G. H. Macnair, A. M. Kelly and Pvt. H. N. Scales. Maxwell Field at Montgomery, Alabama, was represented by five airplanes in command of Lieut. R. C. Wriston. Other pilots and visitors with him were: Lieuts. Herman Woollard, Robert Ashley, D. D. Arnold, Reuben Kyle, J. J. Powers, Tech. Sgt. G. H. Fisher, Staff Sgt. W. P. Miller, Tech. Sgt. R. E. Choote and Joseph Liner.

Three planes from the navy flying base at Pensacola, Florida, were piloted by Lieuts. L. C. Lawbaugh, G. Van Deurs and D. S. Cornwell.

Among privately owned planes on the field for the celebration were those of: G. M. Jones, Hammond, La.; J. Winston, Reserve, La.; A. D. Kellogg, Meridian, Miss.; E. T. Centanie, New Orleans; G. N. Ricks of the Crescent City Airways and Edgar G. Smith of New Orleans.

The Menefee Airways, Inc., proprietors of the new field was organized several months ago to engage in commercial airplane transportation, aerial photography and other airplane activities. Its officers are J. C. Menefee, president; Robert Bauman, secretary-treasurer and James R. Wedell, vice president and manager.

FRAME work for the aviation beacon to be known as the Jung Hotel Light, has been completed and it is expected that the light will be in operation within another month. It will be a revolving beacon of 8,000,000 candlepower and will be visible to planes from a distance of 35 miles.

THE Louisiana legislature has passed two laws affecting aviation throughout the state. Municipalities are given the right by one of the bills to expropriate property to be donated to the federal government for aviation purposes. The other bill requires all aviators carrying passengers to have aviators' licenses.

THE St. Tammany-Gulf Coast Airways of New Orleans has been awarded the contract for carrying mail from New Orleans via Houston and San Antonio to Brownsville or Laredo, Texas, at $1 per pound. The service will connect with the air mail service to be established by the Mexican government from the American border to Mexico City. It will mean a direct mail service by air from Boston via New York City, Atlanta and New Orleans to Mexico City.

THE Young Men's Business Club has voted unanimously in favor of a $2,000,000 municipal bond issue for the construction of an airport that will be in keeping with the size and importance of the port of New Orleans. A committee has been named to handle the matter. It consists of William N. DeWald, Lewis Bourgeois, A. Adair Watters and Victor Grima.

WEST VIRGINIA NEWS

THE Parkersburg Aero Club has been incorporated as the Parkersburg Aero Corporation and has leased a landing field southeast of the city.

The club at present is the owner of three planes. Pilot Ted Matthews, and his brother, Christy, have been secured as pilot and field mechanic respectively. The club will be given special privileges at the municipal airport to be opened in the near future.

Visiting airmen are invited to drop down at the field pending the opening of the city airport. Repairs can be made at the club field as there is a licensed rigger and a licensed mechanic there at all times. Free transportation to and from the city of Parkersburg will be available. Ships coming in from the west follow the Little Kanawha river from its junction with the Ohio about two and one-half miles to the field on the southeast side.

A NEW, IMPROVED GOGGLE

All the good features of the best goggles incorporated in this DeLuxe Model.

Maximum vision, curved lenses, optically correct, soft, hollow rubber cushions, clog proof ventilator in frame.

Representatives wanted everywhere

Large discounts to schools and dealers



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AIR-ZIP-ONS

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Corded, white gabardine, absolutely non-rip.
Genuine hookless zippers on chest and legs.
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Tailored to fit; not an overall.
Six large pockets.
Adjustable patent ring belt.
Side slits with zippers to get to inside pants pockets.
Silk embroidered wing insignia.



$9.00, all sizes from 36 to 46

AIR TRANSPORT EQUIPMENT, Inc.
Carle Place, L. I., N. Y.



Photo courtesy 165th Photo Sec., A. C., T. N. G.

McConnell Field at Nashville, Tennessee.

TENNESSEE AIR NEWS

IT takes C. A. Griffith 30 minutes to get to the railroad station from his home in Knoxville, Tenn. It takes him 30 minutes to fly in his Whirlwind Waco from his front yard landing field to his mine at Pruden, Tenn., on top of which he has a field. And such a field! It is about 800 feet long, the upper end of which lies on quite a slope of the mountainside, and is not wider than 100 feet at any point.

Griffith first began to fly to and from his mine eight years ago. Walter J. Carr was his pilot then, and they used a Standard. Next Jim Ray, now with Pitcairn, was his pilot, and a Canuck was used. Ben Faulkner and Frank Andre, now of the Knoxville Aero Corporation, flew with him, using a Canuck. Then Griffith bought a Waco-9 and recently, obeying his hankering for a little more power to climb out of the hills faster, he bought a Whirlwind Waco from the Embry-Riddle company, Lunken airport.

Throughout the winter of 1927-28 he has used the plane constantly, and bad weather has forced him to use the train only four times.

Griffith is active in aviation at Knoxville. He is endeavoring to have the municipal airport established on an island in the Tennessee river, two and one-half miles from the post office.

McCONNELL FIELD

NASHVILLE, TENNESSEE

ALTHOUGH McConnell field, Nashville's new airport, has not been officially dedicated, it is completed so far as its service to the cause of aviation is concerned. The 105th Observation Squadron, Tennessee National Guard, has already moved its hangars and planes to the field, and it is being used regularly by resident commercial pilots and commercial planes en route from Chicago and the Middle West to Atlanta, Ga., and Florida.

A sky sign with the letters "Nashville" and a white arrow pointing in the direction of the field has been erected by the American Banks of Nashville on the roof of the 15-story American Trust Company building, the highest in the city.

McConnell field is named in memory of the late Lieut. Brower McConnell, of the 105th Observation Squadron, who lost his life in bombing maneuvers over Langley field, Va., in the summer of 1927. It is located on a 130-acre tract of land four miles from the city, and just off West End avenue.

The runways traverse the field from southeast to northwest and from southwest to northeast. The first is 1,800 feet in length and the latter 1,500 feet. Two hangars of steel construction, 175 by 66 feet, are located on the northeast corner of the field. There is a 20-foot space between each hangar that has been roofed and made into a tool and machine shop.

Besides being headquarters for the 105th Observation Squadron, it is the home port for the Nashville Air Transit Corporation and the McCollough Aircraft Company. The Dixie & Northern Air Lines will use the field when its planes start on regular schedule between Chicago and Atlanta.

LOUISIANA AIR NEWS

WORK has been completed on Selman Field at Monroe, La., making this an up-to-date airport for all commercial flying.

The field is three miles east of the heart of the city and contains 140 acres of level terrain. It is equipped with a concrete and brick hangar with steel truss roof, 100 feet by 100 feet.

This field was devised and constructed by the Ouachita Parish and its management turned over to the Huff Daland Dusters, Inc. The principal organization work and many of the details for the establishment of this field were handled by Mr. Travis Oliver, president of the Central Savings Bank and Trust Company of Monroe.

On Selman Field the Huff Daland Dusters, Inc., are also operating a flying school. Among their pupils is practically the entire bank staff of the Central Savings Bank and Trust Company.

ALABAMA AIR NEWS

BY ROBERT H. BROWN

THE Anniston post of the American Legion recently sponsored a campaign to have the name of the town painted on several of the buildings, directing aviators to the airport there.

THE Thirty-first Division of the Air Corps at Roberts Field, Birmingham, discussed plans at a banquet last month for the summer camp at Mobile from August 5 to 9. They also pledged support to the United States Air Force Association. Policies of the association were told by Lieut. Donald Beatty, director of the Alabama division of the association.

Three new bureaus of the United States Air Force Association have been appointed in the South, according to W. O. Browne, director of the Southern Division of the Association, with headquarters in Birmingham. The bureaus are to be located at Atlanta, Anniston, Ala., and Mobile, Ala.

Palmer Gailard has been selected as director of the chapter at Mobile. Directors for the other two bureaus are to be selected.

RICHMOND, VA., NEWS

WITH the aim of giving the students an opportunity to study aviation in both its theoretical and practical aspects the University of Richmond has formed a flying club. J. Day Lee, jr., R. R. Patterson and L. S. Cooper were instrumental in its formation and are the charter members of the club. The club has been given the hearty cooperation of many men prominent in the aeronautical field and has as its honorary committee V. S. Lawrence, jr., S. P. Ryland, Col. McAdams, E. B. Sydnor, Mayor J. Fulmer Bright, Gov. Harry F. Byrd, and Commander Richard E. Byrd.

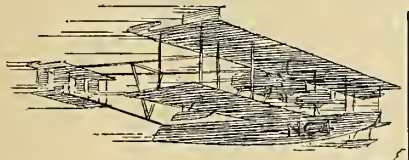
KENTUCKY AIR NEWS

THE Aero Club of Kentucky is endeavoring to get Kentucky's outlying towns to set aside fields for airports. The towns are requested to paint the name on a suitable building with arrows and distance to field; mark center of field with 80-foot circle; put up wind indicator; maintain fiield in such a manner as to permit airplanes to land and take off; form a chapter of the Aero Club of Kentucky with at least ten members enlisted.

H. L. Gentry was appointed chairman of the airport committee and has addressed civic clubs in several Kentucky towns. As a result the Eastland Field at Harrodsburg was formally dedicated on June 16th. Six planes were flown from Louisville in formation and landed on the Eastland Field. Dedicatory addresses were made and the newly formed Harrodsburg chapter of the club entertained.

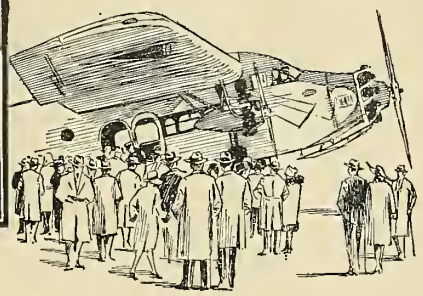
The following club members flew from Louisville to Harrodsburg: Lieuts. J. A. Ellison; W. Sidney Park, secretary and treasurer; C. A. Shields; Capt. L. S. Vance, vice-president; Sergeant Chester Lampkin; H. L. Gentry, director and chairman of airports; and Col. Lucien Beckner.

Nine Years Ago this Man Piloted the First Plane Across the Atlantic



The NC-4—first plane to cross the Atlantic, piloted by Lieut. Walter Hinton. Left Trepassey Bay, Newfoundland, and arrived Lisbon, Portugal, May, 1919.





Walter Hinton

was pilot of the NC-4. *first* plane to successfully cross the Atlantic. He was the *first* man to fly from North to South America. He is the *first and only* world-famous flyer to give home-study students the benefit of his experience. During the War he was a crack flying instructor for the Navy. He knows how to teach men the *practical* way. He gives you your foundation for real success and a real future in Aviation. Get his Free Book—TODAY.

Do You Know . . .

that America already has *over 1,000* airports and landing fields in active operation? *83 concerns* are manufacturing planes. A combination airline-railway transcontinental service will begin shortly. Big plans for regular trans-Atlantic passenger lines are being completed. Planes many times larger than any ever seen are under construction right now. Trained men are needed to operate, service and sell. The Industry of the Century is *just beginning!* Get ahead in Aviation before Aviation gets ahead of you!

Today 400,000 Miles of Flight are Behind the Training He Offers YOU

LIEUT. WALTER HINTON — first trans-Atlantic pilot of them all — is ready to train YOU for Aviation. He is ready to give you the benefit of his years of flying experience — more than 400,000 miles of flight, over land and sea, over jungle and civilization. He is ready to give you the benefit of his *proved* ability to fit men for Aviation—proved in War days when the U. S. Navy chose him for one of its crack instructors, proved today when his students are stepping into important jobs and important futures in the Industry. He will give *you* your Groundwork—*right at home*—for a real job in the air or on the ground.

He teaches you every inch of a plane. He shows you exactly *how* each part works, and *why* it works. In clear, simple language and hundreds of photographs he gives you a brass tacks knowledge of motors, plane design and construction, instruments, theory of flight—everything. He shows you *where* and *how* to get into the Industry. You get the *right* facts and *all* the facts about Aviation Today—in practical form that you can turn into CASH!

Hinton's Free Book brings you full details on how to get into Aviation and how to put yourself in line for its richest, biggest opportunities. Use the coupon—NOW!

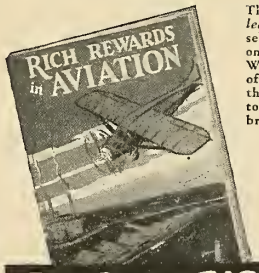


"I gave a brief outline of your Course to one of Ford's pilots, flying a Cleveland - Detroit plane. He told me to 'stick to it' as I am on the right track." J. Masek, 3561 E. 106th St., Cleveland, Ohio.



"Without your Course and the help of your Employment Dept. I would not have become Sales Manager of this company in the short time I have been in Aviation." R. N. Dobbins, Mt. Vernon Airways, Alexandria, Va.

Hinton's Free Book Shows You HOW



This book is showing keen men how to *learn* Aviation—how to *train* themselves for its best jobs—how to *cash-in* on today's greatest opportunity. Whether you want to fly or want one of the *more than 40* Big-Pay jobs on the ground, get the Facts First. Hinton's book brings them. The coupon brings your copy. Mail it NOW!

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Walter Hinton, Pres., 102-H
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Dear Lieut. Hinton: Send me your Free Book. Tell me how I can train under you, right at home, for a real place in Aviation.

Name .....

Street ..... *Age* .....

City ..... *State* .....



Planes and personnel of the Roosevelt Field Flying School, Roosevelt Field, Long Island, N. Y.

NEW YORK AIR NEWS

AIR ASSOCIATES, INC., have added F. Briggs Barlow to their field force. Barlow will travel throughout Eastern United States to promote the numerous lines Air Associates, Inc., are handling, and coöperate with all airplane operators.

THE Guaranteed Garages Corporation of Richmond Hill and Garden City has been awarded the contract for the erection of a steel hangar for the Associated Aeronautical Corp., at Jamaica Bay Airport. This is the beginning of the Greater New York Airport.

The Guaranteed Garages Corporation has long foreseen the future of aviation and has arranged a national sales force to take care of demands in this field. Their steel buildings have an interlocking patented device sheet of which the units are contructed to prevent leaking and permit same to be taken down and re-erected with 100 per cent. salvage.

THE Aviation Engineering School is now in larger quarters in the center of New York City. They have recently added to their staff Lt. Henry Sperry, who received his flight instruction at Brooks and Kelly Fields. Wilbur H. Williams will take charge of their hangar on Curtiss field, where they have several transport pilots operating.

ROOSEVELT FIELD FLYING SCHOOL, INC., offers a complete course of flying instruction at the famous Roosevelt Field, Long Island, from which the historic transatlantic flights of Lindbergh, Byrd, Acosta, Chamberlin and Levine have been made. The course is under the supervision of capable and experienced pilots using the most modern equipment.

The management provides parachutes of the type approved and used by the U. S. Government, which must be worn by both students and instructors during flight. Planes and motors are subjected to rigid inspection daily.

Courses in cross-country flying and acrobatics are available to those desiring same, in addition to the regular ten-hour course. Lieut. H. B. Clarke is manager of the school. Paul J. Lannin, owner of the field, is president.

THE first model of the new Rainbow beacon has been permanently installed at Mitchel Field, Long Island, after a series of tests extending over a year under all kinds of weather conditions.

The new Rainbow beacon is a luminous, glowing light, generating the equivalent of 500,000,000 candlepower through electrified gas-filled tubes. During the testing period, the new light successfully penetrated fog and heavy mist for over 25 miles and in clear weather the orange-red glow was plainly visible to fliers from 70 to 80 miles distant. It is not in the form of a searchlight but is an open lamp which, in addition to its tremendous penetrating range, will diffuse light over the entire landing field and can also be used to flash code signals to fliers en route.

The inventor of the Rainbow beacon is Ray R. Machlett, 26 years old, son of the late Robert Machlett, the first manufacturer of Roentgen tubes in America. Young Machlett is head of the laboratories of Rainbow Luminous Products, Inc., and has developed the present beacon from the commercial tube-lighting adapted by his company for outdoor illumination.

CHRISTY MATHEWSON, son of the late "Big Six" pitcher of the New York Giants, is the leading juvenile in WGY's weekly aviation playlets broadcast from the Schenectady Airport. Mathewson is a student engineer of the General Electric Company and recently made his first solo flight.

Members of the Schenectady Airport Staff and Mathewson have been engaged by WGY to broadcast this series of flying lessons in dialogue form every Wednesday night at 8:00. The flying instructor of the playlets is actually the flying instructor of the airport, Phil Lucas, with a long record of wartime and commercial flying. Victor Rickard, manager of the airport, has his part as does William Luke, superintendent of the flying school.

ONE of the new Loening cabin amphibians which have been purchased by the Canadian Transcontinental Airways was flown from the plant of the Loening Company in the center of New York City to the center of Montreal in three hours and twelve minutes. The plane was piloted by Robert Moore. This is the second Loening amphibian delivered to the Canadian transcontinental Airways. It is powered with a Pratt and Whitney 425 h.p. air-cooled engine, and accommodates pilot and six passengers.

Another amphibian was delivered by air to a unit of the International Air Service, Ltd., at Hamilton, Ontario.

Another amphibian will be delivered to the Elliot Air Service of Hamilton, Ontario, the end of this month, and another has been ordered by the Northern Aerial Minerals Explorations, Ltd., of Toronto.

THE Consolidated Instrument Company of America, Inc., has recently been awarded an experimental contract by the Bureau of Aeronautics of the Navy Department. This contract calls for the development of a new type of tachometer with a 2¾ inch dial. A new altimeter will also be developed along similar lines.

MR. E. L. VAIL, vice president of the Jaeger Watch Company, New York City, makers of the Jaeger day Swiss-American timepiece for motor cars and airplanes, sailed for Europe on June 30th, for his annual trip abroad to visit his foreign factories and European service stations.

Jaeger factories are located in Switzerland, Paris and London and service stations are maintained in such additional cities as Brussels, Berlin and metropolitan centers.

THE HUDSON RIVER NIGHT LINE has announced its intention of selling through tickets to Montreal in September via boat to Albany and via airplane from Albany to Montreal.

The passenger will leave here at 6 p. m aboard a Night Line boat, arriving in Albany at 5:30 the following morning. He will board an airplane operated by the Colonial Airways at Albany at 7 a. m. and arrive in Montreal shortly after ten. The Night Line will also make connection at Albany with planes leaving for Cleveland, Buffalo and points west.

WASHINGTON, D.C., NEWS

By Sam Barker

"YES, maybe the lion and the lamb lay down together, but only one of them got up," the old darky responded when told the proverbial story. At Bolling Field a figurative lion and lamb literally lay down side by side. And it was the lamb that got up first. The Gnome-Jupiter powered Swiss plane of Lieut. Col. Daza who stopped in Washington en route to Bogota, Columbia, was being serviced alongside Bob Loutt's OX5 Challenger. Bob, the genial flying representative of the Kendall Oil Company, was on his way to Los Angeles for the air races in September. He is making the trip in easy stages and hopped off for the Municipal Airport at Richmond after a brief call on Major Clarence Young and other Department of Commerce, Aeronautics Branch, officials.

Colonel Daza, his pet jaguar and plane took off for Langley Field, Va., a few days later. The Colonel also is making his trip in easy stages. (*Continued on next page*)

Butler STEEL Hangars



For Durability, Fire-Resistance!

The all steel construction of Butler Hangars makes them non-combustible. The walls are steel. The roof is steel. The frame is steel. The sash are steel.

The wall and roof sheets are 24 gage tight coated galvanized steel. These sheets are bolted to the steel frame and to each other with galvanized bolts.

All sheets have deeply drawn paneled corrugations. These corrugations are deeper and wider than ordinary mill corrugations. This bolted construction and paneled corrugations assure rigidity, strength and durability, and makes possible practically 100% salvage.

There is plenty of light for all working conditions.

The doors operate easily because the wheels of the doors are equipped with roller-bearings.

The Butler Steel Hangars are complete. They may be economically enlarged. They may be dismantled, moved and re-erected with practically 100% salvage.

Get this valuable information

Butler Steel Hangars are available for individual planes or for many planes. Literature and attractive prices on Butler Steel Hangars will be sent on request.

Send for full information.

TRADE STEEL BUTLER PRODUCTS MARK

Butler Manufacturing Co.

Kansas City, Mo. Minneapolis, Minn.

(Washington, D. C. News continued)

A FIRE of undetermined origin burned the hangar and eight planes of the Potomac Flying Service at Hoover Field, on the early morning of July 3. The activities of the service, which since the first of the year has carried almost 11,000 passengers on sightseeing trips over Washington, were necessarily curtailed for a while as it lost three Fairchilds, three Berliner monoplanes and two Travel Airs. The Flying Service is now functioning as usual.

THE Washington Airport across the road from Hoover Field is hopping an increasing number of passengers, perhaps due to its sign reading, "fly in sister ships to the *Spirit of St. Louis.*" Some of the Ryans are to be used on the Washington-New York passenger run to be put in regular operation shortly by the Seaboard Airways, Inc.

The former chief pilot at Washington Airport, Herbert Fahy, recently resigned to take a position with a California firm. He will fly throughout the country demonstrating Ryan monoplanes. His place at the airport is being filled by Walter A. Brooks, former Department of Commerce Inspector, who is organizing the passenger run to New York with Joe Boudwin in charge of operations at the field during his absence.

ARKANSAS AIR NEWS

By Carl Olsson

THROUGH coöperation of Chambers of Commerce, civic clubs, public officials, railroads and persons interested in aviation, seventy-five towns in Arkansas have been marked for the benefit of aviators flying over the state, according to Charles M. Taylor, secretary of the Arkansas Real Estate Association. Taylor is a licensed pilot and chairman of the Airport Committee of the Little Rock Chamber of Commerce.

The marking of the towns grew out of a week's campaign by the real estate association which began June 10.

Three signs have been completed in Little Rock, all with arrows leading to the Little Rock Airport. One is on the roof of a building in the heart of the city, while the others are on the outskirts of the city and on opposite sides of the town.

One sign is believed to be the largest air marker in the United States. It is nearly 600 feet long with letters 30 feet high and 10 feet wide. It can be seen for many miles. The sign cost about $150 which was donated by 15 Little Rock business men.

On two of the principal air routes across the state, air signs have been completed in 24 towns. There are 13 completed signs on the route from St. Louis to Texas and 11 from Memphis west across the state.

EQUIPMENT to be used in the annual encampment of the 154th Observation Squadron, Arkansas National Guard, beginning August 19, has been overhauled and is in readiness. The encampment will be held at Toney Field, Pine Bluff. All planes have been overhauled. New barracks will be ordered at Pine Bluff for the occupation of the personnel of the squadron.

THE LITTLE ROCK Chamber of Commerce is planning an air tour of the state, to be held the last week in September.

FOUR changes recently took place in personnel at the Little Rock Airport. Lieut. Stanton T. Smith, adjutant for two years at the Little Rock Air Intermediate Depot, was transferred to Kelly Field, San Antonio. Lieut. Wright Vermilya, operations and engineering officer of the 154th Observation Squadron, has resigned his active duties to become factory representative of the Arkansas Aircraft Company, and Lieut. James C. Youngblood, also of the squadron, has resigned to become associated with the Southern Cotton Dusting Corporation of Tallulah, La. Warrant Officer John Gebelin, Sr., in charge of ordnance at the air depot, will be retired from active service during a three-months' leave which began July 1. He had said he would not retire until another member of his family entered the service. His son, John Jr., entered West Point July 2.

Lieut. Joe T. Shumate of Conway has been appointed operations and engineering officer of the 154th Observation Squadron, succeeding Lieut. Wright Vermilya, who resigned from active duty.

THE first aviation beacon to be installed in Arkansas was placed July 14 on the roof of the Home Insurance Building at Little Rock. It is a B. B. T. half-lens flash beacon, government approved. In the event Little Rock is designated a port of call on the proposed air mail line from Louisville to Dallas, it is probable the beacon will be made the official beacon for Little Rock. Credit for installing the beacon is given to Lawrence Banks, vice-president of the Home Insurance Company, a licensed pilot and chairman of the aeronautical development committee of the Little Rock Chamber of Commerce. The beacon flashes the letter "H," four dots in Morse code, five times a minute, with a 1,500 candlepower lamp. It is located in the downtown business section 150 feet above the street, and has in connection a small floodlight pointing in the direction of the Little Rock airport.

THE LITTLE ROCK Chamber of Commerce has established an air information bureau which will include information on airports, aviation facilities, pilots, air markers, routes and other facts regarding Arkansas aviation.

ALBERT VOELLMECKE, chief designing engineer of the Arkansas Aircraft Corporation of Little Rock, has returned from a month's trip to Europe where he toured aviation development centers and held conferences with prominent persons in regard to betterments for the Command-Aire, a three-place biplane being built by his company. The company is building three planes a week and has 35 men employed.

TRUMP AIRWAYS, INC., operators of a Buhl Airsedan at the Little Rock Airport, has been moved to Tulsa by Clarence A. Trump, president, and Sherman Willard, pilot

OKLAHOMA AIR NEWS

By Ernest W. Fair

OKLAHOMA now has four airplane factories with the removal of the Red Bird Aircraft Company from Bern, Kansas, to Oklahoma City.

The company features a three-place OX5 powered open biplane with three other models also being built. These are a two-place open biplane, a two-place cabin monoplane and a four-place cabin monoplane. The four place cabin monoplane has a Wright Whirlwind J5 engine while the other models use the OX5.

E. G. Keller of Wichita is president of the company. The other officers of the company are: Fred Durland, Oklahoma City, W. W. Driggs of Bern, Kansas nd D. G. Marshall of Wichita, vice presidents; Charles G. Lewis of Winfield, Kansas is secretary-treasurer and D. B. Todd, Oklahoma City, D. M. Hennessey, Oklahoma City, and Fred D. Olmestead, Ponca City, are other officers. Harry Frey, at one time with the Lincoln-Page company, is chief designer and engineer for the company.

THE Paul Braniff Airlines, Inc., has started their Tulsa-Oklahoma City airline. The Stinson monoplones are making two trips both ways, one in the morning and one in the evening, and carrying full capacity loads. A charge of $10 is made for the trip, taxi service being offered at both ends of the line.

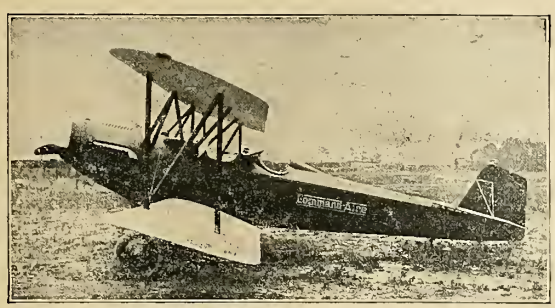
THE University of Oklahoma at Norman will soon have a school of aeronautics. Tau Omega aviation fraternity, which succeeded in getting the original idea through is now making plans for pushing the university school.

THE Oklahoma Air Transport Co. is completing their 12-place hangar at the Oklahoma City airport and as soon as it is completed will perfect plans for the state wide air service they have been planning. Oklahoma City is to be the hub city of the service.

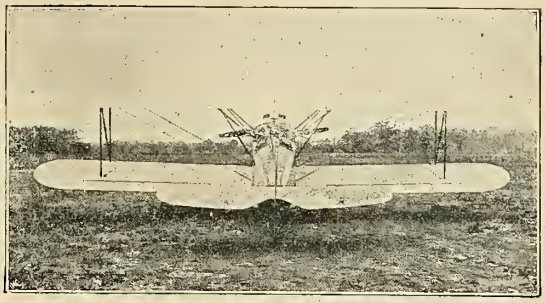
FRANK GOUGH, former automobile man, has completed work on an airplane engine weighing a pound per horsepower, he has announced and will release plans as soon as the factory, he and his associates are planning, is started at Oklahoma City.

THE Ponca City Airways, Inc., has been organized at Ponca City and will begin business immediately. A passenger line is to be established between Ponca City and Tulsa to use four-place Ryan monoplanes. It will operate six days a week but will have no connection with the present N. A. T. mail route to Tulsa.

Mayor H. C. Mulroy, Harry Cragin, John Flournoy, Clyde E. Muchmore, editor of the Ponca City *Daily News,* W. E. Rice, district judge, and Ed P. Souligny are backers of the company. Flournoy is to have charge of operations on the airline.



A Better Ship!



The Command-Aire

A Statement of Plane Facts!

To Owners and Prospective Owners:

The COMMAND-AIRE is "A BETTER SHIP" of advanced design, rugged construction, beautiful appearance and outstanding performance. It provides the thrills and pleasures of flying you have so often dreamed of and hoped to experience.

The purchase of a COMMAND-AIRE is a genuine compliment to the sound business judgment and good taste of the buyer.

To Dealers and Prospective Dealers:

COMMAND-AIRE dealers are, without exception, enthusiastic and satisfied dealers, because they make new friends with the sale of each COMMAND-AIRE, and in addition find the COMMAND-AIRE sales franchise a most profitable one by virtue of the close co-operation from the factory coupled with minimum sales resistance encountered by the COMMAND-AIRE.

First in the Air — Now First on the Air

We have just closed an advertising contract with Radio Station WIL, located at St. Louis, Missouri, whereby the COMMAND-AIRE will be on the air daily. We believe this is the first long term radio advertising contract made in America by any airplane manufacturer. This is only one of the many helps given COMMAND-AIRE dealers.

Production is nearing a ship a day in an effort to catch up with orders on file. A limited amount of choice territory is still available to responsible dealers and individuals. Full information will be supplied upon request.

Price, $2,450 complete, less motor and propeller at Little Rock. $3,250 at Little Rock, complete with Curtiss OX-5.

The Command-Aire is built under authority of Approved Type Certificate No. 53.

Arkansas Aircraft Corporation

Little Rock, Arkansas

TULSA AIR NEWS

By Shelton Lawrence

THE new Tulsa municipal airport was formerly dedicated July 4, as well as the new air mail service, part of the Chicago to Dallas air mail route.

Approximately 13,000 people witnessed the ceremony in the rain. Twenty-four of the Reliability Tour planes, which arrived at Tulsa on July 4, and six U. S. Army planes assisted in the celebration which lasted three days.

OTHER large cities in Oklahoma with first class airports are Muskogee, Bartlesville, Okmulgee, Ponca City, Guthrie and Chickasha. Enid voted $50,000 in bonds for a municipal airport, and Ardmore, Miami and McAlester have municipal airport projects in various stages of promotion.

Other cities considering the establishment of municipal ports are Altus, Elk City, Norman, Frederick, Ada, Vinita, Alva, Tonkawa, Henryetta and Pawhuska.

BEACONS now being constructed on the Tulsa and Ponca City air extension to the Chicago and Dallas mail line, have been completed as far as Hominy, Oklahoma, and the entire route will probably be finished by September 1. There are two revolving beacons on the Ponca City route; the others are stationary and at regular intervals.

TWELVE Kansas boosters of the Chanute good-will air tour roared into Tulsa, landing in their trimotored Ford monoplane at McIntyre airport.

Aboard the plane piloted by Percy Hutton, were the following men: Roscoe Vaughan, banker; John P. Harris, newspaper editor; Hy C. Priester, bondsman; Clyde Bloomheart, merchant; J. Howard Pendleton, James A. Allen, R. L. Mendenhall, Elmer Conklin, E. M. Cooper, Dr. L. D. Johnson, John D. Spielman and F. R. Bennett.

The Tulsa reception committee was composed of George Watkins, Will Anderson, J. Frank Matchett, Ralph Berry, Lee C. Moore, Harry B. Gale and Cyrus S. Avery.

DIRECTORS for the new Tulsa municipal airport, to represent the underwriters, were elected recently at a meeting of the Tulsa Chamber of Commerce. The board will administer all the affairs of the airport, direct all improvements and select local management until it is taken over by the city or county.

Members elected are: W. G. Skelly, Harry H. Rogers, H. C. Tyrrell, Robert Garland, Waite Phillips, Omer K. Benedict, and Cyrus S. Avery.

J. O. PITTMAN, 13 years old, was the Tulsa boy who won both the outdoor and the indoor model airplane flying contests sponsored in this district by the Tulsa *World*. He was sent to Detroit by the *World* to participate in the national contest for boys sponsored by the Airplane Model League of America.

REGULAR daily passenger air service has been established between Tulsa and Oklahoma City. Two trips will be made daily, and transportation to and from the airport is included in the fare.

OHIO AIR NEWS

By T. E. Lunsford

THE Columbus Air Board will give place to an airport commission of 15 members appointed by the Mayor, to study airport facilities and to formulate a program for obtaining them.

Three councilmen and twelve business men are on the commission appointed by the Mayor. Members of the commission are: Henry W. Worley, Frank C. Karns, Edgar T. Wolfe, John M. Vorys, Alexander P. Hammond, Robert Lazarus, Malcolm D. Jeffrey, B. G. Huntington, John A. Kelley, Don M. Casto, Stanley M. Ross, Emile E. Watson and Clare E. Cook. Kline L. Roberts is secretary of the commission.

ACTIVITIES of Albert E. Harter, Republican candidate for state senator, in behalf of air regulation have been indorsed by the Columbus Airport Commission. Harter presented the resolutions to include a plank for air legislation in the Republican state platform. This plank was adopted by the Convention. In his campaign for senator, Harter will stress the need for statewide aerial regulations.

HERBERT E. SMITH, widely-known mechanic and pilot, has become sales manager of the Thompson Aeronautical Corporation, Cleveland, after terminating his services with Ford's Chicago airport. He will devote his time to the sale of Stinson-Detroiters, distributed by Thompson in Ohio, Michigan and parts of Pennsylvania.

AN aviation beacon will be installed by the George D. Harter bank on top of its 12-story building in the business district of Canton.

THE date for the dedication of the Gallipolis has been set for August 23.

A CAMPAIGN for an airport for Ironton has been started by the Rotary Club of that city. President E. J. Merrill appointed a committee composed of Capt. Gilfillan, A. Kerraman, George Richardson and W. W. Hamilton, to invite the cooperation of the other clubs of Ironton, including the Chamber of Commerce, to join in the movement, to suggest ways and means of providing funds for the purchase of a field.

JACK CECIL, who has been with the American City Bureau of Portsmouth for the past five years, has accepted a position as sales manager of the Vulcan Aircraft Co. of that city.

CAPTAIN BRADLEY JONES, chief of the naval branch of Wright Field, has confirmed reports that preparations are being made for another round-the-world flight in a race against time. The flight will be made from Chicago during the present summer. Lieut. Leigh Wade, who already has made one air trip around the world, and F. K. Smith, Chicago, will be pilots, while Captain Jones will be navigator.

FINAL tests for a speedometer for airplanes are being made at the department of mechanical engineering, Dayton University. The device is the invention of W. C. Rogers of San Antonio, Tex., formerly of the United States Air Corps.

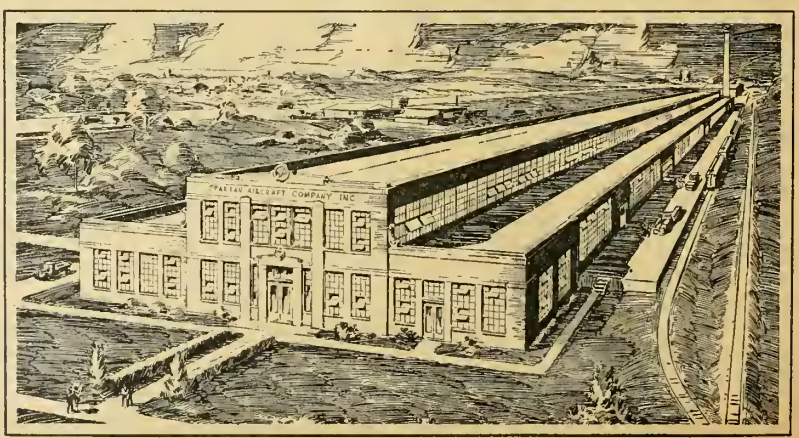
The speedometer records the speed of airplanes, or other aircraft, above ground or above sea. It includes a moving map which shows the course over which the machine is flying and the rate of speed. The inventor claims that with the device a pilot cannot be lost in fog banks, in darkness or in clouds; the instrument is so accurate that it will indicate the drift, if any, due to winds and will also show whether a plane is standing still or going forward in case of a severe headwind.

THE Richard B. Reed municipal Airport was dedicated at Van Wert, Ohio, on June 24. More than 20 planes took part in the ceremony.

The "On-to-Van Wert" prize money was split between Art Davis of East Lansing, Mich., and Robert A. Coulter of Cleveland. Coulter, formerly of Van Wert, now pilots for the N.A.T. of Chicago.

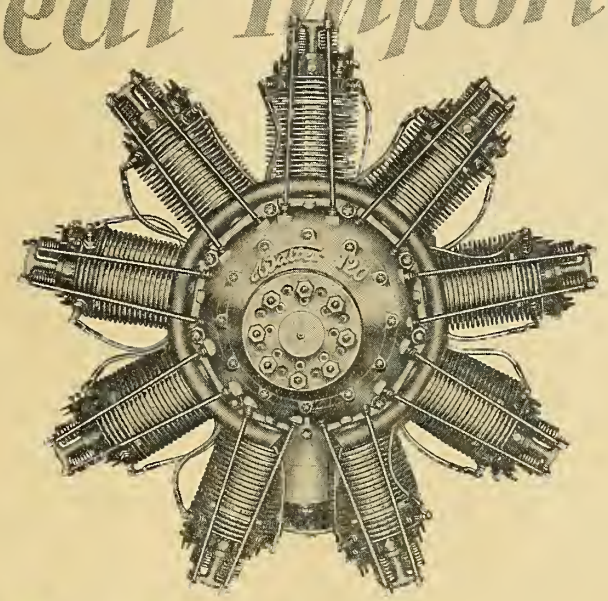
Art Davis in his Waco-10 was the winner of the free-for-all. Crabill, in his OX5 Eaglerock, won the dead-stick landing contest. Miss Dorothy Curran and Gene Rock of Fort Wayne made parachute jumps.

(*Continued on next page*)



New plant built by Austin for the Spartan Aircraft Co., Tulsa, Okla.

An Announcement of Real Importance!



SPARTAN secures the world-famous WALTER ENGINE

Holder of 5 World's Records

Spartan Aircraft Company announces that after a thorough investigation of aircraft engines of both American and European manufacture—an investigation which carried our engineers on a European tour of fifteen thousand miles and into a majority of the important engine factories of the world—the famous WALTER Engine, manufactured at Prague, Czecho-Slovakia, has been selected as the ideal power plant for SPARTAN Airplanes. The WALTER Engine holds five world's records in flight, and gruelling tests by our engineers have conclusively proven it to be one of the most highly developed and efficient aircraft engines made.

We have arranged for exclusive North American distributing rights for this engine, and now command an adequate supply for use in equipping SPARTAN Airplanes. We are also in position to supply these engines to other selected manufacturers of fine aircraft. Inquiries are invited.

SPARTAN AIRCRAFT COMPANY

Tulsa SPARTAN Oklahoma

(Ohio Air News continued)

THE American Legion has placed the word Alliance in 20-foot letters on the roof of the McCaskey Register factory. Arrows point to the airport and to Tranam field. The City Savings Bank also is painting Alliance on its roof, with direction arrows.

THE Alliance Aircraft and Motor Corp. has twenty planes and motors under construction at present. Most of the machinery of the Hess Aircraft Co. of Wyandotte, Mich., has been moved to the big Morgan Ordinance Plant at Alliance until the company's factory is built.

MISS KATHRYN FALL, 16-year-old Alliance high school girl, made her "solo" flight recently after only 2½ hours of instruction. C. O. Bell of the Alliance field was her instructor.

THE Vulcan Aircraft Co., of Portsmouth, Ohio, manufacturers of the American Moth monoplane, recently put this plane to a gruelling test and found it satisfactory in every respect. They will go into production immediately.

THE B. F. Goodrich Rubber Company of Akron, O., has taken delivery of a five-place, Wright-powered, Fairchild monoplane to be used by company executives in visits to their various factories and dealer organizations.

CLEVELAND AIR NEWS

By David E. Irwin

THE new hangars of Dungan Airways, Inc., and the 112th Observation Squadron. Ohio National Guard, were officially opened last month at Cleveland airport.

A luncheon in the Dungan hangar opened the day's proceedings. Among the speakers were Harold E. Dungan, president, and Joseph Bergeron, secretary and treasurer.

At the close of the luncheon members of the First Pursuit Group from Selfridge Field, Mich., arrived in formation and treated the thousands of spectators to a demonstration of aerobatics.

In the evening a banquet was served in the guard hangar with high officials of the guard in attendance. City Manager Hopkins and Major Thomas Herbert, commander of the local guard unit, were among the many speakers.

The Dungan hangar is located on the east end of the field and the new guard hangar, constructed by the Austin Co. of Cleveland is on the south side of the field. Both provide office and class room space.

In addition to conducting a flying school Dungan Airways do taxi and contract flying and service and store transient ships. The concern is also distributors for Waco and Fairchild planes.

Frederick L. Smith, flight commander of the O. N. G. aviation unit; Leon B. Lent, former division superintendent of the air mail; Lieut. S. J. Sampson, Army Air Corps reserve, and William Ward, former army instructor, are among those of the faculty.

Harold E. Dugan, dean of the school, is a commercial pilot and a former officer in the U. S. Air Corps.

UNITED AIRWAYS, INC., who plan to open a passenger line between Cleveland and Chicago in the near future have taken over the old air mail hangar vacated by the 112th Squadron.

The hangar is to be used temporarily until one can be built. Ground has already been leased for the new structure but it will not be ready in time for the opening of the route.

STEPS are being taken to regulate the airplane traffic over Cleveland. An ordinance in council awaiting final action provides that only licensed ships flown by licensed pilots can be flown over the city.

An arrow, which is planned as the biggest in the country, is to be painted on the roof of the Otis Steel Co. plant here, pointing to Cleveland airport. Members of the American Business Club of Cleveland are to do the work. They have already painted arrows on the roofs of Hotel Westlake and the Chandler Motor Co. plant.

CITY Manager Hopkins, father of the municipally owned Cleveland airport, is pushing forward plans for a lake front field.

It is planned to extend the lake front out 300 feet by "filled in" land transferred to the city by the New York Central and Pennsylvania railroads. The field is to have a lake frontage of 2,500 feet and about 2,000 feet on the land side.

The present airport, however, will not go into the discard as it will be used for heavy planes and as a service field while the lake front field is to be for light planes and as a depot.

THE new Cleveland-Louisville air mail line of Continental Air Lines, Inc., will not be opened until August it was announced here

The delay is occasioned by the delay in installation of beacon lights and the preparation of intermediate landing fields. Such fields are to be at Akron, Columbus, Dayton and Cincinnati.

CONNEAUT, O., has been selected as an intermediate field in the Cleveland-Buffalo leg of the Cleveland-Albany air line of Colonial Western Airways, Inc.

A 50-acre field in the east part of the town has been leased by the Department of Commerce, from the Conneaut Land Co., a subsidiary of the Carnegie Steel Corp. It is now being graded and a beacon and boundary lights are to be installed soon.

STOUT AIR SERVICES, INC., operators of the Cleveland-Detroit airline, have inaugurated a combination air-water system.

Passengers arriving in Cleveland from Buffalo, N. Y. by boat now can book passage through to Detroit by plane. Detroiters can also make a round trip to Cleveland using a boat on one leg, either coming here via boat and returning by plane or taking the plane to Cleveland and the boat back. The arrangement has been made with the D. & C. and the C. & B. transit companies.

This company has also started daily sightseeing bus service from downtown Cleveland to the municipal airport.

ORGANIZATION of the New York, Chicago and Pacific Airways Co., with the purpose of establishing passenger airlines between the principal cities of the United States, has been announced.

Cleveland is to be an intermediate stop on the Cleveland-Chicago link of the proposed transcontinental route, giving this city four proposed passenger airlines to Chicago. Those already announced are the N. A. T. Flying Service, Stout Air Services, Inc., and United Airways, Inc. The N. A. T. Flying Service has promised that its line will be in operation by spring of next year, while all the others intend to get into service this summer.

Trimotored cabin planes are to be used on the New York, Chicago and Pacific line, according to the announcement from Victor H. Holland & Co., of Chicago.

AN aeronautical information bureau has been made a part of the Cleveland Automobile Club's touring information department, and now is functioning.

The new bureau will give detailed schedule information on all passenger aerial services having depots at the airport. It will supply information as to the flying time between all cities serviced by the aerial passenger companies as well as rates of fare.

SIX aviation beacons have been installed in the top of the new railroad union terminal depot on Cleveland's public square.

The beacons, with 33-inch reflectors, work on 32 volts and consume 1,500 watts. They are visible for from 50 to 60 miles.

The Sperry Gyroscope Co. made the lights which were installed by the Hatfield Electrical Co.

THE Detroit & Cleveland Navigation Co. plans to open a passenger airline between those two cities using flying boats capable of carrying 26 passengers, A. A. Schantz, president, has announced.

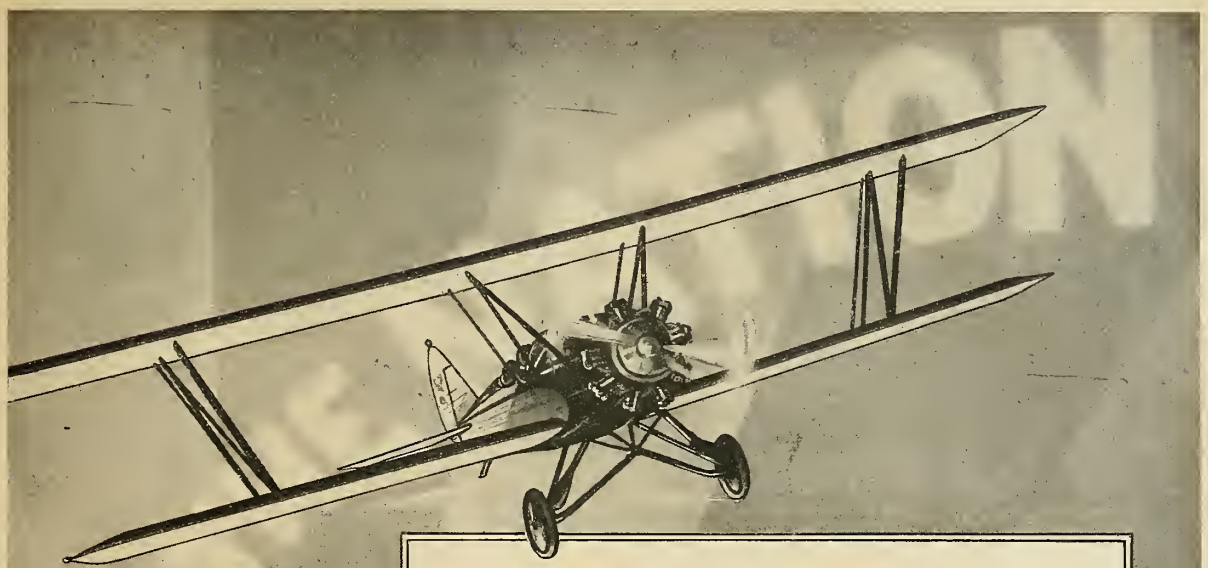
The German-made Dornier Super Wal flying boats are to be used.

MADISON AIRWAYS CO. plans to inaugurate passenger service between Madison-on-the-Lake and Cleveland and Pittsburgh, according to A. H. Goddard, of Mentor, one of the organizers.

The company will fly only by appointment. With Goddard in organizing the company are Norman Biddison and Dewitt Eldred. Wesley King is to be their pilot.

LAKEWOOD high school students have organized a club for the purpose of studying the science of the airplane and to construct working models.

Phillip J. Borofka, of the technical department of the school, is to sponsor the new organization. The club has been given permission to use the school shops after school hours.



GREATER FLYING COMFORT

Raised cowling which gives full protection from the wind.

An open cockpit offering the utmost in visability and yet giving cabin comfort.

A detachable motor mount allowing the installation of any motor, 90 to 260 h.p. A choice of motors for any sort of commercial or sport flying.

THAT'S THE NEW AND IMPROVED
ALEXANDER EAGLEROCK

Increased rigidity. A SAFETY FACTOR OF 8 +. Center wing section. Additional fuel capacity. Larger baggage compartment.

A dealer organization covering the country — offering to the purchaser the well known ALEXANDER SERVICE.

The new center section design, less motor and propeller,

Cash Price, $2250, Factory Field

ALEXANDER AIRCRAFT CO.

Rm. 403, Alexander Industries Bldg., Colorado Springs, Colo.

CHICAGO AIR NEWS

By Duke Jordan

OFFICIALS of the Chicago & Illinois Midland railway have demonstrated that they are air-minded by ordering the installation of air markers in cities and towns through which their railroad runs between Springfield and Peoria. All stations in the 39 towns served by the road are being marked with six-foot letters painted on the station roofs.

CHICAGO'S municipal airport is assured of at least a 99-year life and it will be more than a mile square. The city was given title to the present 280 acres and additional acreage through a trade between the city and the board of education which gives the airport the land on a 99-year lease. John A. Casey, manager of the Chicago Municipal Airport, announced that the airport will undergo immediate improvement as a result of the city council's action in alloting additional funds for that purpose. The southern edge of the field, along Sixty-third Street will be tiled for drainage; new runways will be constructed and the existing ones widened. A complete administration building is included in the improvement plans.

Arthur Johnson and Cliff Wolrath are the new traffic cops at the municipal airport. Dressed in white and carrying red and white flags they are easily visible from the air and are of great assistance in keeping traffic orderly. That activity is increasing in the airport is evidenced in the necessity for having men on hand at all times to handle the arrival and departure of planes.

SEAPLANES from the aviation unit of of the Great Lakes Naval Training Station at Great Lakes, Ill., are giving valuable assistance to Chicago yacht clubs in patrolling race courses during sailing and motorboat records.

Two more NY-2 planes have been added to the equipment at Great Lakes naval training station, making a total of six ships for seaplane work. With the other ships on wheels for local and cross-country flying, the ground personnel under the direction of Virgil Jackson, is kept unusually busy. Lieut. P. E. Gillespie is commander of the station.

H. B. Griggs, chief aviation pilot at the Great Lakes Naval Training station, announced that an additional 1,000 square feet of floor space has been made available for plane housing and maintenance shops.

THE Central Airways Corporation will build a large hangar near the municipal airport. The hangar will measure 80 x 140 feet and will accommodate about 14 ships. Included in the structure will be a passenger waiting room and ticket office, operations office, repair shops and stock room.

The Central Airways corporation operates an air taxi service, air tours and air lines in the central west. It will also operate a garage for touring ships.

CHICAGO'S new giant aerial beacon in the loop atop the Roanoke Tower was dedicated July 15. William P. MacCracken, Assistant Secretary of Commerce for Aeronautics, was among the speakers.

The new beacon rises 520 feet above Madison and Clark streets, in the heart of Chicago's loop. The beacon consists of two rotating searchlights of 8,000,000 beam candlepower. The light is visible to fliers for more than 100 miles.

ILLINOIS' first state aviation tour which visited fifteen cities in four days already shows results. Four Illinois cities visited have announced that their airport facilities will be improved. They are: Kankakee, Decatur, Champaign and Sterling.

MORE than 150 members have joined LaSalle Flying Club, affiliated with the Chicago Branch of the Civil Air Corps, Inc. The club has taken a three-year lease on the Eagle Airport, on Lake Street, west of Elmhurst, a suburb of Chicago. New hangars are to be constructed and the club aims to make it a Class 2 airport. Flying instruction at cost to members of the club will be given under the direction of Leslie B. Furman, field superintendent. Delivery is expected soon on a Lincoln-Page dual-control biplane.

THE Eagle Airport school of aviation at Hinkley, Ill., plans the installation of night flying equipment, according to Herman J. Neubauer, president.

SERVICE on the new Michigan air mail line between Chicago and Michigan cities began July 17.

Airads, Inc., have recently taken delivery on two new Internationals. One, an F-18 Whirlwind cabin job, will be used for advertising and passenger business and the other, an open F-17 OXX6, for passengers.

CAPTAIN and Mrs. Homer M. Berry have returned from their aerial honeymoon in a Laird Gosling speedster of the Gray Goose Air Line fleet. They flew to Okmulgee, Okla., the home of Captain Berry's parents.

THREE new four-passenger Fairchild cabin monoplanes have been purchased by the Scenic Airways, Inc., for use on its combined air-rail service between here and Los Angeles, according to Lawrence Scudder, director of the organization. The Fairchilds augment the several trimotored Stout 12-passenger monoplanes used for sightseeing trips over the Grand Canyon. The service is to start this month.

LOUIS MEISTER of Marysville, Mich., has been demonstrating a Buhl Airsedan at the municipal airport.

THE Gray Goose Air Lines' hangar, at Municipal Field, has been completed. This hangar, of modern steel frame construction, was designed and built by the Austin Company. It is 88 feet wide and 122 feet long. Offices and dormitory are housed in the street end of the building.

Gray Goose Lines, Inc., was organized last year and has as its directors: Allan Jackson, vice pres., Swift and Company; C. C. Allen, vice pres., First National Bank, Kenosha, Wis.; James T. Wilson, vice pres., Nash Motors Co., Kenosha, Wis.; Donald MacMurray, vice pres., Acme Steel Company; Charles C. Dawes, pres., Dawes, Maynard & Co.; Harry N. Vale, vice pres., and treas., Kent Garage Investing Corp., New York City; E. C. Divine, pres., Old National Mortgage Loan Co.; M. C. Meigs, Publisher, Chicago *Herald Examiner*.

Officers of the company are president, Donald MacMurray; vice president, Alden B. Swift; secretary-treasurer, and general manager, W. Daspit; operations manager, Captain H. M. Berry.

Operating equipment consists of one Stinson Detroiter for cross-country flights and two Ford-Stout all-metal ships for sightseeing.

MR. L. D. SEYMOUR, chief engineer of National Air Transport, Inc., was promoted to the position of assistant general manager of the company, in charge of all its activities. Col. Paul Henderson will continue as vice president and general manager of the company, but will not be active in its day to day activities. Mr. Seymour's headquarters will be in Chicago at the general offices located in the northeast corner of the Municipal Airport.

MONMOUTH, ILL., NOTES

THE Midwest Airways Corporation took the first step in a policy of expansion early in July when a new field was opened at Waterloo, Iowa, which will be used as the headquarters of the company's Iowa sales and service activities. The expansion policy calls for a chain of fields in Iowa and Illinois.

Oren P. Harwood, chief pilot and sales representative of the Midwest Airways Corporation, has moved to Waterloo and will have charge of the company's Iowa business. The Waterloo field has a new ten-ship hangar, is "T" shaped and is located four miles due east of Waterloo.

Fifty-one Waco airplanes have been sold by the Midwest Airways Corporation in its two-state territory since January 1, 1928, according to John H. Livingston, president and general manager.

IOWA AIR NEWS

CENTERVILLE'S new 160-acre airport was opened on June 18 by being the first stop on the Iowa Good-Will Air Tour starting from Des Moines on a five-day tour and stopping at twelve cities. Governor John Hammill delivered the opening address, and talks were made by Senator Dan F. Steck and Congressman Lloyd Thurston.

The airport is located three and one-half miles southwest of the city. It is within eight miles of the Moline-St. Joseph-Kansas City air mail line of the National Air Transport, and approximately midway between Moline and the Missouri river points.



WANTED! 5000 Airplane and Engine Mechanics

Get Real Training That Qualifies for Success!

Five thousand trained airplane and engine mechanics are needed at once. 50,000 will be needed next year. For every plane that flies, twenty experts are needed in production and maintenance.

Airports are opening every day. New transport lines, new factories, new dealers, and distributors are starting every week. Factories are expanding, doubling and tripling their capacities. "MEN—MEN WHO KNOW AVIATION!" is the cry of the industry.

There are ten to twenty jobs on the ground for every one in the air! And these men are establishing fortunes forging ahead to success. You can train yourself for one of these good jobs at Parks Air College, in much less time than you could become a transport pilot—and be ready for a big pay position. The man who qualifies may rise in a few months to Superintendent, Designer, Engineer, General Manager! Realize this opportunity, then make *your* start.

$125 a week is an average salary for a foreman in an aircraft or engine factory. Graduates of our Advanced Ground Course can easily anticipate earning that in a short time. More is assured as you rise to Superintendent, Engineer or General Manager. Mechanical training is the road to ownership of factories and transport lines. The greatest pilots, the great executives of the air, started as mechanics. They rose fast because they knew the *details* of airplanes and motors.

Here's a Complete, Advanced Aviation Mechanic's Course

We have invested over $125,000 on buildings, equipment, and instructors. We provide you with the training that Aviation demands. The course lasts four months—it's thorough; you couldn't cover it in less time.

Parks students learn by *doing*—by actually performing every conceivable operation on Whirlwinds, OX5, OXX6, Hispano, Anzani, Liberty and other airplane motors.

They take down and assemble airplanes of many types. They can learn every truss and spar, every wire and turnbuckle, every screw, bolt, and nut! A Parks graduate knows airplane construction from start to finish—from the longerons which are a ship's backbone, to the dope which is her complexion. All this training is given by airplane, engine and production experts under actual factory conditions. While taking this course you can live right on Parks Airport, in our Dormitories, built especially for your convenience. It will cost you only $3 per week. You can eat in our restaurant so your total living expenses will be only $8 or $10 per week!

INVESTIGATE – GET THE FACTS

Maybe it sounds too good to be true—4 months' training that will fit you to make big money in the fastest growing industry in America! But it's a fact. And the demand for men—the opportunity—is a fact. Aviation today is already in the era of expansion, and it needs you.

Don't hesitate—don't ponder. Get started!

ACT NOW! The industry is crying for men—and paying unheard of salaries. Ford, Travel Air, Stinson, Swallow, Cessna, Curtiss, Douglas, Waco, Fairchild, Ryan—are only a few of the factories that are turning out *thousands* of ships. Men are needed to build them—to build the motors, to service them, repair them.

FREE This Big Book



It tells all about the course!

GET IN ON THIS!

Don't delay getting into this great industry until thousands are in. Get your training now while men are scarce and salaries high. Don't let the cost trouble you. Full training in our Complete Advanced Ground Course is $300. Right now we have a special rate. Men are needed. Our best advertisement is satisfied graduates. We want a full school all summer, so we cut the price practically in half! For thirty days you can have this $300 Advanced Ground Course for only $165 —but you must come now!

Send the coupon and we'll hold the special $165 rate until you get here. Then take the next train for St. Louis—for success and fortune.

If you want further information send for a free copy of "The Man Who Tunes the Plane", that gives full particulars. But act now! Many will come at once. Either you come or send for the booklet today!

GROUND SCHOOL DIVISION

PARKS Air COLLEGE inc.

226-E. Mo. Theatre Bldg. St. Louis, Mo.

GROUND SCHOOL DIVISION
PARKS AIR COLLEGE, Inc.
226-E Mo. Theatre Bldg., St. Louis, Mo.

I enclose $25 deposit on the $165 rate for the regular $300 Advanced Ground Course.

Send me "The Man Who Tunes the Plane".

Name .....

Address .....

ST. LOUIS AIR NEWS

By A. W. League

THE city changed its plans at the last minute and has decided to submit a $2,000,000 bond issue to the voters at the time of the August primaries for a municipal airport. Plans for financing the airport have undergone many changes in the past few months; however, from all indications it looks as though the present plan is going to stick. We have made up our minds to have an airport here in St. Louis that will be second to none and should the bond issue fail to pass, which is not likely, some other plan will be adopted. "Slim" Lindbergh was elected an honorary vice-chairman of the general committee for aiding the bond issue and his active aid in the short campaign before the election has been promised. An elaborate publicity campaign for passage of the issue has been launched and a speakers committee will conduct a widespread program in which the merits of the bond issue proposal will be laid before civic and business organizations.

MORE than 100 St. Louisan members of the Air Board of the Chamber of Commerce and their families are making a two months' tour of Europe to study foreign aviation developments. The delegates will conduct an intensive study of air routes, equipment and general layout of airports with a view to applying what they learn in the construction of Lambert Field.

A FLIGHT from St. Louis to the Argentine Republic in South America will be made this fall. The purpose of the flight will be to advertise St. Louis and St. Louis products in Central and South America and to perpetuate the friendship and trade existing there between this city and those countries. Complete details of the flight are being worked out by J. A. Troy, director of the Foreign Trade Bureau of the Chamber of Commerce in coöperation with local business firms. It has been planned to make the trip in short hops.

THE Robertson Aircraft Company has purchased one of the two new $25,000 hangars recently completed by the Von Hoffmann Aircraft Corporation. These new hangars are of brick and steel construction, equipped with electric lights, concrete floors, large rolling doors and are large enough to house several trimotored jobs. The Robertson Company recently placed orders for eighteen new ships of various design, four of which are trimotored Fords. This new hangar will be used to house the trimotored jobs. A carload of Wacos, two Travel Air OX jobs and two Ryan Broughams have already been delivered. The balance are expected to be delivered within the next month.

THE National Guard Squadron has received two new Consolidated training planes, equipped with Whirlwind motors. They are the first air-cooled jobs that have been used by the squadron. This brings the total number of ships belonging to the squadron up to nine.

FRANK WATTS and Gentry Shelton have taken over the Shell Gasoline concession on Lambert Field and have employed Alfred (Columbia) Dunlap to handle the service end of the company.

THE installation of the 2,000,000 candlepower rotating beacon light at Lambert Field marks the first step in the lighting system that will make the field available for night flying. The light was originally donated to the field by "Casey" Lambert and will be maintained by the companies operating at the field.

HARRY HALL KNIGHT, one of Lindbergh's backers and prominent St. Louisan, has been taking flying lessons on Harold Bixby's Whirlwind Travel Air and is a very apt student. After a few hours of instruction his instructor, "Boots" Dempsey, turned him loose for a solo, which he completed with the skill of a veteran.

GEORGE LEA LAMBERT, son of Major A. B. Lambert, dean of St. Louis aviation, has gone to work as a flying instructor for Parks Airlines and is putting in long hours with his students during these days of good flying weather. George has a Siemens-Halske Travel Air of his own and is a licensed transport pilot.

E. F. BASKEY, who used to fly the mail out of St. Louis in a Hisso-Jennie in 1921, is back in St. Louis again, working at Lambert Field as an instructor for the Von Hoffmann Aircraft Corporation.

ST. LOUIS got a thrill that it has missed for the past three years when twenty-four planes of the National Air Tour landed at Lambert Field. The tour might have been called the Whirlwind Tour for at least three-fourths of the ships in the tour were powered with Whirlwind motors. Lead by a Buhl Airsedan closely followed by a Ryan Brougham, the participants of the tour roared across the finish line in quick succession. The St. Louis entry, a Curtiss-Robin flown by Dan Robertson, lead the field in the low-powered class. Incidentally, the Robin is the only ship in the tour powered with an OX5. Dan said he would have given the Whirlwind jobs a tight race with his but the Robin had to stop for a worm.

THE Curtiss-Robertson Airplane Mfg. Co. is expected to put out its first complete Robin, an OX5 cabin monoplane, about August 1st. G. F. Griffin, formerly with Fairchild Airplane Mfg. Co. of Farmingdale, L. I., has been appointed sales manager of the company. For sales purposes the company has divided the country into twenty-five territories.

THE Von Hoffmann Aircraft Company has started operation of a ground school. Courses in navigation, meteorology, aerodynamics and theory of flight will be included in the ground school work.

A CONTRACT for two new student barracks with accommodations in each for 50 men has been let by Oliver L. Parks, vice president of the Parks Airlines, and work on the new buildings will be started within a short time. Two other barracks with accommodations for a total of 80 students are already crowded to capacity.

A MERCHANT of St. Peters, Missouri, nine miles west of Lambert Field, has painted an arrow on the roof of his establishment, pointing the way to Lambert Field. St. Peters, which is on the route from Kansas City, is the point at which pilots begin to wonder whether they are headed for St. Louis after all.

THE first of the modern improvements to be made at Lambert Field as a part of the proposed $2,000,000 airport bond issue program is almost ready for use. It is a 6-inch water main which has been extended from Carsonville, 4½ miles from the field. The cost of the extension, about $51,000, has been paid by the companies operating at the field, but it is expected that the city will refund the money after the passage of the bond issue proposal to be submitted to the voters August 7th. The money paid out by the city will in turn be paid back as new subscribers tap the water line. Carrying an ample supply of water to the field, the new line fills a long felt need.

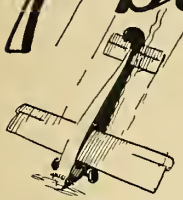
AIR MAIL WEEK, during which there will be an exhibition of the new mail planes, parachute jumping and stunt flying, has been set for the week of July 29th. There will be an open house celebration at the field under the auspices of the Robertson Aircraft Company. The object of the celebration is to stimulate interest in the air mail and to help the citizens of St. Louis to become more acquainted with aviation.

DEAN W. McKIM MARROTT, of Washington University, announced plans for the new $4,000,000 eye, ear, nose and throat hospital, on which it is expected work will be started in October. The "Lindbergh pavilion" in the new hospital will commemorate the enviable position St. Louis has won in the field of aviation and will be devoted to medical research to further the science. Its facilities will greatly exceed any similar research institution in the world and is expected to attract aviation students for medical tests from all established flying schools. Dr. Harvey J. Howard, after ten years of eye research for the Rockefeller Institute at Union Medical College, Pekin, China, is coming to Washington University as head of the Department of Opthalmology. He will also serve as one of the directors of the research for aviation. As a consultant for the U. S. Army at Mineola Field, L. I., during the war, he originated most of the army tests for aviation students and airplane pilots, which have since been expanded.

LT. CLIFTON C. HUTCHISON has recently been appointed Flight Manager and Director of the Flying School of the Robertson Flying Services, Inc. Lt. Julius Johanpeter has joined the Robertson Flying Services as instructor.

(*Continued on next page*)

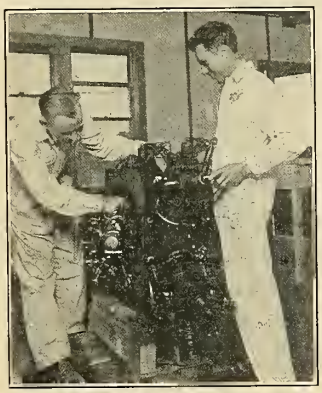
You can land big-pay jobs by learning Aviation at PARKS Air COLLEGE inc.



TRAINING! That's the secret of success—to big paying jobs. AVIATION! There's the field for the imaginative, ambitious young man like yourself! PARKS! That's the air college for you to attend. TODAY! That's the time to start, for delay means lost opportunities.

YOU SHOULD LEARN TO FLY!

You like to soar among the clouds, to glide in smooth swiftness, to swoop down from the heavens, to travel with the speed of the wind from town to town! You do, don't you? But you've never experienced the joy, the thrill of feeling *your hand* on the control-stick of a plane? *You can in just four weeks!* That's how quickly you can learn to fly at Parks Air College of St. Louis.



YOU CAN ADD $50 TO $150 TO YOUR WEEKLY INCOME!

You don't need to be told all the opportunities open to a trained aviator. You can see them all around you. They are greater *now* than ever before. Today new factories, new airports, new airlines are being operated —every one of them looking for men of your character *who know aviation!* And they are paying top wages—some transport pilots make as high as $1800 a month. You study under the direction of such pilots at Parks College. All our flying instructors are licensed transport pilots.

YOU SEE, LEARN AND EXPERIENCE ALL AVIATION ACTIVITY AT PARKS

Parks Air College is housed at Parks Airport—St. Louis' most convenient air field. Parks Airport is a large, completely equipped field.

Nearly every day great passenger liners, fast private planes, luxurious cabin ships land at Parks Airport for service, to discharge or take on passengers, or to deliver valuable express shipments. You can see and learn the practical application of all class room and shop study.

The Air College division consists of dormitories, restaurant, great steel hangars, 25 training planes equipped with Whirlwind, OX5 and other famous motors, complete classrooms and mechanical shops, and all the necessary and up-to-the-minute equipment. We have over $75,000 worth of training planes alone!

Our present course not only turns you out as a practical flyer—it teaches you Air Navigation, Aerodynamics, Airplane Design and Maintenance, Motor Overhaul, Theory of Flight, Shop Methods and Management, Airport Management, Air-Traffic Control—and other equally important subjects. We do not know of so complete a course in Aviation at any other school. It has drawn students from 42 states; many of them inspected other schools before selecting Parks!

$300 TO $1500 A MONTH FOR EXPERT, TRAINED PILOTS

Will you invest 3 months' time and a few hundred dollars to triple your daily income? Will you work for $15 a day? Or $25 a day? Or more? You should soon be making that much after learning aviation at Parks. R. H. M. from California says, "I chose Parks after visiting and looking over 10 other schools. It's by far the best!" J. D. Z. from Pennsylvania says, "I chose your school over 8 other leading schools. You've got them all whipped!"

Come right now—see if you don't agree with the other fellows about Parks.

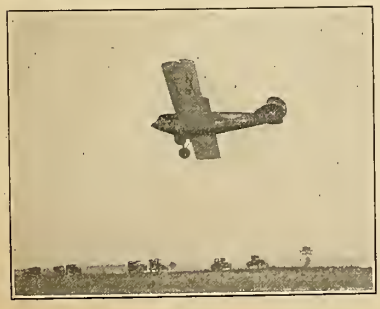
FREE—BIG ILLUSTRATED BOOK!

Recognize your opportunity. Before you turn this page, before you think of something else—send to us for our big illustrated book—*"Skyward Ho!"*



The coupon or your name and address on a postal card will bring it. Clip and fill in the coupon NOW!





SAVE MONEY BY LEARNING NOW!

Delay will cost you money. Start learning *now* while you can get these two great Courses—the Flying Course, and the Regular Ground Course, BOTH for only $295—instead of the regular price of $450—a clear saving of $155. If you're serious about flying and realize you need to get your training as quickly as possible, come to school or write us immediately! We'll reserve your application and hold the special rate if you send a $25 deposit. Then, you're protected—you'll save the difference between the regular price of $450 and this special price of $295—*good only during the month of August!*

Mail the coupon with your deposit today. Then catch the next train and come to school at once to take advantage of this great saving. **Parks Air College, Inc., 202-E Mo. Theatre Bldg., St. Louis, Mo.**

Today's the day to get started

Parks Air College,
202-E Mo. Theatre Bldg.,
St. Louis, Mo.

☐ I would welcome your FREE book, "Skyward Ho!"

☐ Attached money order for $25. Reserve my place in School at $295 rate for full Flying and regular Ground Course. I will be there ..... 19....

Name .....

Address .....

(St. Louis Air News continued)

A CLASS of 33 graduates, the first to receive their diplomas since the Parks Air College moved to their own field, Parks Airport, were banqueted in the Ballroom of the Broadview Hotel, East St. Louis, on Tuesday evening, July 3rd. Col. John Paegelow, commanding officer of Scott Field, spoke to the graduates on the development of aviation and its future.

Twenty-five training planes are now in use at the Parks Air College This includes twenty-three OX5 motored Travel Airs, a Whirlwind Travel Air and the Stinson Detroiter.

New Mechanics Course Offered by Parks Air College

A NEW course in advanced airplane and engine mechanics has been added to the curriculum of the Parks Air College at St. Louis, Mo. This new course is in addition to the regular ground course previously and still offered by the school.

For the new course, which will qualify men for position as airplane and engine mechanics, foremen and superintendents of factories and other commercial aircraft organizations, complete new shops, motor rooms and class rooms have been built. The course will be under the personal supervision of Oliver L. Parks, vice president of Parks Airlines, Inc., Derek White, Dean of the Parks Air College, and Richard F. Hardin, A. E., Lt., U. S.N.R., general superintendent of Ground School activities.

Motor instruction in the new division of the school will include practical work on Whirlwind, Liberty, OX5, Anzani, Caminez, and four other makes of new production engines.

Airplane work will include the construction of complete airplanes piece by piece. This will include wing building, covering and doping, steel tube fuselage construction, weiding, blue print reading, factory production methods and other necessary details.

This new division of the Parks Air College opened on August first and on that date the college had a total attendance of over 200 students.

KANSAS CITY NEWS

By H. H. James

RICHARDS FIELD, formerly the principal flying field of Kansas City, has been taken over by the Commercial Airways Corporation and will be improved and operated as a commercial flying field.

The new concern is headed by Albert A. Yoemans and Ridelle Gregory.

The Porterfield Flying School, operated in connection with the factory of the American Eagle Aircraft Corporation, will continue to use Richards Field.

D. H. HOLLOWELL has been employed by the American Eagle Aircraft Corporation in the capacity of sales manager. He has had extensive experience as a wholesaler in the automobile industry, having served the last five years with the Auburn Automobile Company.

A NEW airplane factory has been started in Kansas City by Ralph A. Beale, president of the Beale Aircraft Company. A new plane, with several distinctive features, designed by Mr. Beale, will be placed on the market by the company.

The machine, a monoplane with an OX-5 water-cooled engine, has a cabin for two passengers and a pilot.

E. J. SWEENEY, president of the Sweeney Automotive, Aviation and Electrical School, will start at once on the erection of a new $60,000 building to house his aviation school. The building will be at the Sweeney airport, on the Kansas side.

NATIONAL AIR TRANSPORT will use, on the night route between Kansas City and Dallas, Douglas planes with 400 h.p. Liberty engines with a 100 pound mail capacity and a speed of 100 miles per hour. The first of the Douglas planes has been received and turned over to Pilot R. L. Dobie.

THE factory of the American Eagle Aircraft Corporation is being enlarged with a 20 x 100 building that will be used as a wing department. The company is having such a rush of orders that production is being increased to 8 to 12 planes a week.

THE Weeks Aircraft Company of Milwaukee has taken the agency for the Monocoupe. Their first sale was to Rudolph Pabst, Milwaukee, a member of the family whose product helped to make the Wisconsin metropolis famous. Fred Ellis, Milwaukee insurance man, was the second purchaser of one of the new ships.

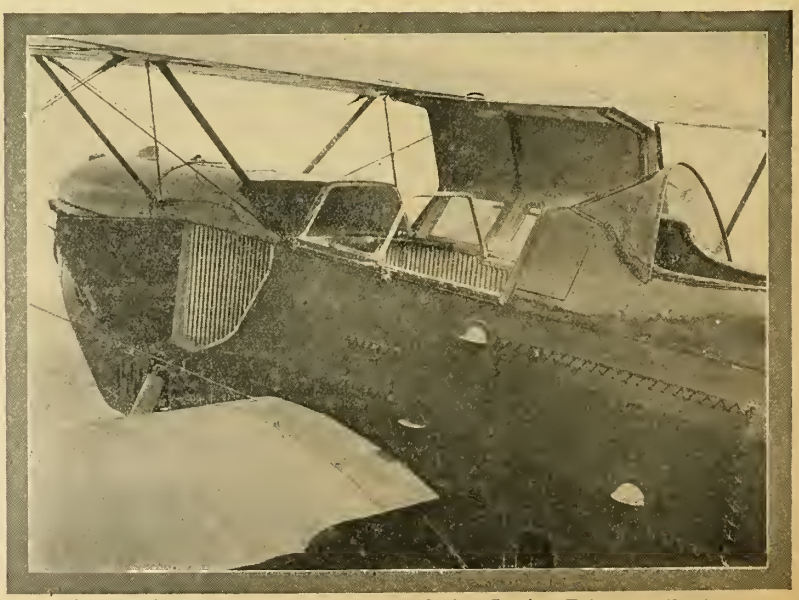
JOHN NOLL, former air mail pilot, has resumed his classes in aviation at the Neenah-Menasha airport after being away for the winter. A flying club was recently formed, the members purchasing an Air King for their lessons and flights.

COL. LINDBERGH GETS NEW CURTISS PLANE

THE new Curtiss Falcon mail plane, completed recently by the Curtiss Aeroplane & Motor Company at Garden City, N. Y., has been purchased by the newly-formed Transcontinental Air Transport, and assigned to Col. Charles A. Lindbergh, head of the Technical Committee, for his personal use.

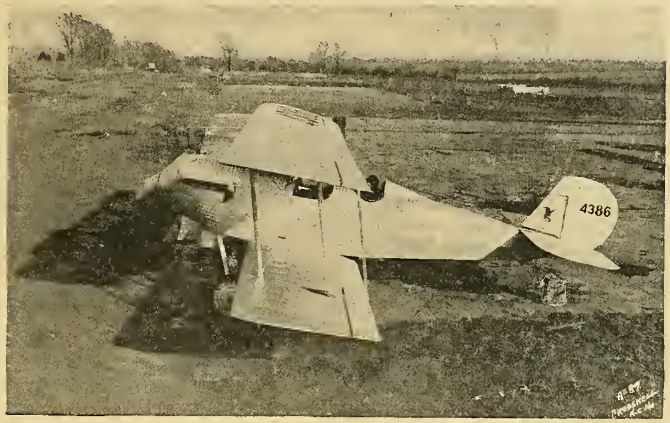
The new plane is exceptionally fast, having a top speed of just over 150 m.p.h. and a cruising speed of 135 m.p.h. The Falcon is powered with a 625 h.p. Curtiss "Conqueror" water-cooled, Vee type engine, of the same type which was used in the Curtiss "Hawk" and "Falcon" planes which won the pursuit and observation plane races last fall at Spokane. The outstanding feature of the installation in Lindbergh's new plane is the fact that the "Conqueror" engine, which normally develops 625 h.p. at 2,400 r.p.m. has been fitted with a special, large Curtiss-Reed propeller, which holds it down to a maximum speed of 1800 r.p.m. This means that, even at full throttle, the engine is never being run at its maximum possible speed, and the life of the engine therefore is greatly increased, while the possibilities of engine failure in flight are lessened. Further, since the engine speed has been reduced, it is possible to cruise at more nearly the maximum speed than would be possible if the engine were being run at full throttle.

The Falcon mail plane is equipped to carry 750 pounds of mail or baggage in two metal-lined compartments, forward of the pilot, in the fuselage. The two compartments have a combined cargo capacity of 52 cubic feet. The rear compartment is also available as a passenger cabin, being equipped with two comfortable folding seats, sliding glass windows, adjustable ventilators and a small corner light inside the compartment. The plane can carry 150 gallons of fuel enough for 5 hours flying.



Mail and passenger compartments of the Curtiss Falcon mail plane.

A Striking INCREASE IN PRODUCTION of American Eagle Planes!



American Eagle with OX5 motor

Thirty days ago the American Eagle Aircraft Company announced facilities which made possible immediate delivery of American Eagle Planes.

You will be surprised to learn how quickly the industry reacted to that announcement . . . and how it has reflected in increased activity in the sales organization.

That announcement was merely the first of a number of important announcements to be forthcoming within the next sixty days.

See the American Eagle Dealer nearest you . . . or write for interesting information.

THE AMERICAN EAGLE AIRCRAFT CO.
2808 EAST THIRTEENTH ST.
KANSAS CITY, MO.



OX5, $2985 Hisso E, $3500 Ryan-Siemans 97 H.P., $4400 Quick 125 H.P., $4150
Anzani 120 H.P., $4800 Hisso A, $3850 Ryan-Siemans 125 H.P., $5825 Salmson 120 H.P., $5650

KANSAS AIR NEWS

By Edwin W. Pryor

THE new airport at Wichita, one mile square, soon will be the center of aeronautical industry in that city.

The Quick Manufacturing Company, organized to convert the LeRhone rotary motors into radial Quick motors and later to produce a new motor, has constructed a $10,000 factory building adjoining the new field. A 15-acre site was purchased, enabling expansion as required.

The Swift Airplane Company has purchased a site adjoining the field and plans to erect a factory there immediately. The Red Bird Company, a young Kansas company producing biplanes, has taken an option on another site adjoining the field.

Robert S. Powers, oil man, is president of the Quick Manufacturing Company, which is independent of the Quick Air Motor Company, which holds the Rhone motors to be converted. Manufacturing equipment at the Houston plant and from the Watkin's Manufacturing Company here will be installed in the new factory. C. E. Quick, converter of the engine, is vice president of the new company.

Survey of the new field has been completed, and work is to start immediately on a 2500-foot runway.

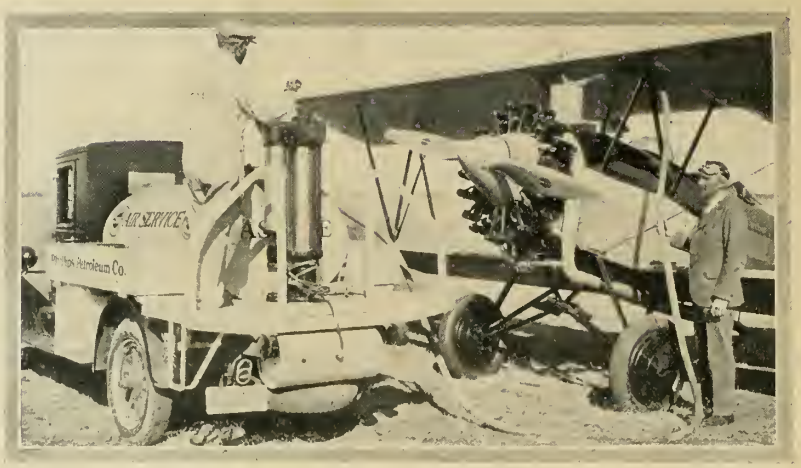
A COMPLETE three-year aeronautical course, with a fourth year to be added next year, will be offered by the University of Wichita when it opens this fall. The bulletin outlining the course was published recently.

Special lecturers for the school include: Walter Beech, president of Travel Air, Inc.; Clarence Braukman, U. S. Department of Commerce aeronautical inspector; Capt. Warner B. Gates, U. S. Air Corps, Marshal Field, Fort Riley, Kans.; Meade Hargiss, secretary-treasurer, Cessna Aircraft Company; M. B. Kirkpatrick, plant superintendent, Swallow Airplane Company; F. R. McGoniga, chief engineer, United Aircraft Company; A. O. Payne, technical and consulting engineer, Swallow Airplane Company; S. P. Peterson, meteorologist, U. S. Weather Bureau; and Mac Short, chief engineer, Stearman Aircraft Company.

Mr. Payne will be director of the new school. Copies of the bulletin, outlining the course in detail, may be had by writing Roy W. Elliott, bursar of the university.

THREE Wichita-made propellers, produced by the newly-organized Supreme Propeller Company, were successfully tested recently on a Travel Air biplane, piloted by C. E. Clark, chief test pilot for the company.

A SPECIALLY-BUILT Stearman biplane has been ordered by the police department of New York for use in combating crime in that city. Much special equipment, including a machine gun and other extra devices useful in police work, will be incorporated in the new plane. Captain William Bucket of the motorcycle division of the department, will be in Wichita August 8 to receive delivery of the ship and fly it east.



Walter Beech having his Travel Air gassed up with Phillips Petroleum.

One of the most completely equipped biplanes ever turned out in Wichita was the Stearman recently delivered to Herbert F. Fales, chief metallurgist of the DuPont Company, Wilmington, Del. It has nearly every type of navigation instrument known. It is equipped with a Whirlwind engine and will be used in the service of the DuPont Company.

TWO new types of Swallow biplanes have been granted approved type certificates by the Department of Commerce, according to Victor Roos, general manager of the Swallow Airplane Company. They are the Whirlwind powered model and the Hispano Suiza jobs.

The true Americans are taking to the air, if Reed Farrell, wealth Osage Indian of Arkansas City, Kan., is any indication. He has ordered a Swallow plane equipped with special navigating equipment.

A CESSNA cantilever wing monoplane, powered with a converted Anzani motor turning up about 120 horsepower, recently climbed to 13,500 feet in an altitude test at Wichita. The motor, converted by C. E. Quick, engineer and pilot, turned up 1,550 revolutions at the highest point, and the engine's temperature was 132 degrees.

A $630,000 deal, involving 200 motors, has been announced by the Quick Air Motors Company and the Butler Aircraft Company, recently organized in Kansas City.

The first of the big order will be delivered in September, and the rest during the following 12 months. The contract was closed through Pat Warner, formerly sales manager for the motor company but now interested in the new plane firm, backed by the Butler Manufacturing Company.

Waverly Stearman, chief designer for Swallow Airplane Company, has accepted an identical position with the new company. He is brother of Lloyd Stearman, president of Stearman Aircraft Company.

THE new municipal airport at Manhattan, Kan., is nearing completion. A hangar and a filling station are being erected on the new field. The airport is financed by the city, but fliers using it will be charged an amount sufficient to pay for maintenance and to retire the bonds. Arthur Scheleen, Manhattan chief of police and former Army flier, will be in charge of the field.

A $250,000 motor contract was closed June 19 between the Swift Airplane Company, and the Quick Air Motors Company, both Wichita firms.

THE United Aircraft Company, manufacturers of a six-place cabin biplane job, has removed from Wichita to Kansas City. Curtis C. Baldwin, president of the Baldwin Harvester Company, is president of the company.

WCHITA now boasts a "flying doctor." He is Dr. T. W. Myers, a specialist who conducts clinics and has patients in several cities in Kansas. To attend his clinic at Pratt ordinarily requires two days under ordinary travel conditions, but with his plane he now makes the round trip in one day.

EIGHT planes, seven OX5 biplanes and one luxurious monoplane, were ordered recently by the latest addition to the Travel Air family of dealers, the Continental Aero Corporation, Ltd., of Montreal.

THE Travel Air Transportation Company, of which Pete Hill, veteran pilot, is president, has opened a service department for airplanes on the Wichita airport. Ray Barker, licensed mechanic, has been added to the personnel of the company.

PERRY HUTTON, who recently purchased a Ford-Stout plane, "barnstormed" Wichita when the National Air Tour arrived here July 2. He "cleaned up," according to friends, making many trips each day and night. He left Tulsa with the tour party.

GEOLOGICAL surveys of Kansas are being made by the department of geology of the University of Kansas, with the coöperation of the aviation corps at Fort Leavenworth.



The First Travel Air Built

Old Number One Comes Home to Stay

OLD Travel Air No. 1 has had an interesting career. Bought in 1924 by O. E. Scott, of St. Louis, its first trip was a call on Henry Ford. It was the first new production job Lindbergh ever flew. It has felt the hands of the great and near great at its controls. In it many prominent bankers, financiers and business men have flown. In it Nussinger and Ruth Elder have made more than one trip. And after having been all over the country on various missions it has at last come home to rest with the honor and sentiment that is its due.

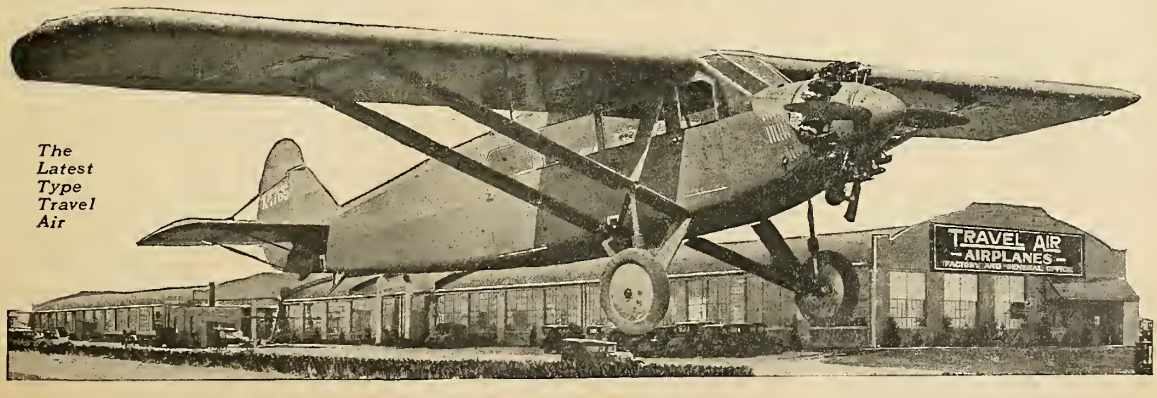
This old ship has had 1750 hours in the air with no replacement. It is still airworthy—still trim. It doesn't look out of place among the latest Travel Air ships staked out along the line at the factory.

Following No. 1 have come hundreds of Travel Airs—in seven types—including the new Cabin Monoplane, "The Limousine of the Air"—each filling a commercial need—all characteristic of Travel Air proven performance with dependability.

The history of Travel Air has been a history of aggressiveness and progress from the day its first ship was built. Its ships are the standard of aircraft comparison and merit the full attention of dealers and prospective buyers the world over.

An interesting book telling the story of Travel Air is free on request

TRAVEL AIR
MANUFACTURING COMPANY
WICHITA, KANSAS



The Latest Type Travel Air



Dr. Frederick Minty uses an Eaglerock for an air ambulance.

NORTH DAKOTA NEWS

By A. E. Riggle

AN airline, carrying passengers and express, the first ever to be established to a North Dakota city, was opened the middle of June between Minneapolis and Fargo. This line, designated as the "Presidential Express", because of its connection with a line between Minneapolis and Superior, Wisc., the summer capitol of the United States, is operated by the Midplane Sales and Transit company of Minneapolis.

One round trip is made daily, the plane leaving Fargo at 8.30 a. m., arriving at Minneapolis at 11 a. m., leaving Minneapolis at 4:30 p. m., and arriving at Fargo at 7 p. m. Two Fairchld cabin monoplanes, four passengers and pilot capacity, are used on the route.

A SURVEY was made last week of the progress of aviation in the state by the Northrup Airplane company of Minneapolis, officials of the Great Northern Railway company and the Vacuum Oil company, with a view to ascertaining future aviation possibilities of the state.

It is understood that the survey was made with a view to establishing airlines within the state.

THERE are now 33 pilots operating in the state. Airports have been established at all of the larger cities and many smaller towns are able to accommodate aviators, many of them already having airports and others establishing them.

Hector Airport, the municipal landing field at Fargo, a 160-acre tract of land, is the largest airport in the state. It is an eight-way landing field, with the runways seeded and packed. One hangar has been built and others will be built shortly, and equipment for the accommodation of aviators has been put on the field, including gas and oil service.

There now are two beacon lights operating in the state, one atop the Herbst Department store in Fargo and the other on the Prince Hotel, Bismarck.

Two schools of aviation are operating in Fargo, one headed by E. M. Canfield and the other by the Hanson Auto School, both having good patronage. There are several private taxi services within the state.

THE International Airway, Inc., has been formed at Minot, N. D., and will establish airlines to all points in the state and several of the larger northwest cities as soon as equipment can be purchased. The company will retail airplanes and accessories.

NORTH CENTRAL NEWS

DR. FREDERICK W. MINTY, a physician of Rapid City, South Dakota, recently purchased an Eaglerock to be used as an ambulance.

Dr. Minty's terriory extends over a large area, especially to the north and east. It extends north practically 200 miles to the state line and east 150 miles in a sparsely settled country with numerous small, inland towns, many of which do not have a physician.

The airplane ambulance proved its value a number of times within a few weeks after it was purchased. Emergency cases were brought to the hospital in Rapid City within two hours when it would have taken five or six hours by automobile. Aside from the element of time, the smoothness of air travel is a humane mode of transportation.

THE Kingston-Rhodes Airways, Inc., of Virginia, Minn., has been organized. Incorporators of the airways which will engage in air transportation and the operation of landing fields includes M. S. Kingston, Eveleth, Minn., and J. C. Richards, J. R. St. Clair, Otto A. Piorer and C. R. Rhodes, all of Virginia, Minn.

The company recently tested out at the St. Paul airport a Ryan monoplane equipped with pontoons. The test was pronounced successful and Mr. Rhodes announced that his company contemplates operating these ships on lakes in north Minnesota.

Milwaukee Light Plane Air Meet

THE Milwaukee Light Plane Club of Milwaukee, Wis., is bringing to Milwaukee on August 25th and 26th the first light plane air meet to be held in America.

Rules for the competition will be practically the same as those used for the light plane meets in England, where the greatest strides have been made in developing light planes.

There will be an On-to-Milwaukee race, speed tests, endurance, load-carrying and altitude races, trophies; and liberal cash prizes will be awarded by the local newspapers and prominent business men.

The club, one of the first of its kind to be organized in America, has a membership of fifty active members. The object of the club has been to create interest and help develop the light plane industry in America. The officers are: A. Paukner, president, Charles Pankenen, treasurer, Miss L. J. Kalishek, Secretary. Chairmen for the meet are, Mr. Pandonen and Miss Kalishek.

Aberdeen Airport Dedicated

ABERDEEN AIRPORT, South Dakota, was dedicated on July 12. J. E. Gorder, president of the local Chamber of Commerce, delivered the dedicatory address, and F. Trubee Davison, Assistant Secretary of War for Air, followed with an address on Aviation and its relation to the Army. Mr. Gorder in telling of the history of the local air field, spoke highly of the excellent support of W. C. Boardman, Chamber of Commerce secretary, and the county and city commissioners in making the project possible.

MINNESOTA AIR NEWS

By W. S. Schley, Jr.

COLONEL CHARLES A. LINDBERGH landed at the St. Paul municipal airport recently to confer with railway officials Louis W. Hill and Ralph A. Budd, Great Northern railroad, on the transcontinental air rail hook-up.

The division of the transcontinental service between St. Paul and Chicago will begin service August 15 with 8-passenger Hamilton all-metal planes. Air passenger service contracts have been awarded to the Northwest Airways, Inc., which has been operating the Twin City-Chicago schedule in the past.

WORK was begun recently on St. Paul's new seaplane port which will be on the Mississippi river adjacent to the present municipal airport. The airport is being raised to a height 21 feet above the water level. It is being filled with sand and gravel dredged from the seaport harbor which is nearing completion.

THE Duluth airport committee disclosed that three planes have already been bought for service between the St. Paul harbor and the lakes, and that Duluth is planning an airport adjoining the bay of Lake Superior and thus forming a combination airport and seaport similar to St. Paul's. They pointed out that Minnesota can utilize its 10,000 lakes to a great advantage with seaplanes.

CANBY'S new flying field was officially dedicated by "Thunder" Johnson of St. Paul when he alighted in his plane on the runway which is within the city limits.

(*Continued on next page*)



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Airfoils, Lift and Drag
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(Minnesota Air News continued)

Johnson, Twin City flier and winner of the Crookston air derby, set an official consecutive "barrel roll" record June 29 when he completed 80 rolls in his Waco plane. He broke the record of 26 which was made unofficially November 13, 1919 by C. D. Custer over March Field, California.

A $400,000 airplane deal was completed in Minneapolis June 30 by which the Mohawk Aircraft Corporation of that city will sell 100 Pinto model planes to the George R. Craig Co., of Los Angeles. The contract calls for a delivery of four planes weekly.

THE NORTHWEST AIRWAYS, which operates the Twin Cities-Chicago route, has reported that it averages better than 800 pounds of mail per week and about three passengers daily. Their present fleet, which consists of Waco, Laird and Stinson-Detroiter biplanes, will soon be increased by two Hamilton all-metal monoplanes.

A TRIMOTORED Ford plane was delivered to the Jefferson Airways, Inc., at St. Paul. The ship is the first of a fleet to be placed in passenger service out of St. Paul and Minneapolis. It will be put on the Twin City-Rochester schedule as soon as the landing field at Rochester is completed.

THE Mohawk Aircraft Co., of Minneapolis, manufacturers of the Pinto low wing monoplane, is located in a well lighted factory building adjacent to trackage facilities. The large number of orders received during the first official showing of the Pinto at the All-American Aircraft Show has crowded the production of the planes beyond the present capacity of the plant, so increasing facilities are being rushed.

MINNESOTA AIR PORTS

Wold-Chamberlain Airport

THE Wold-Chamberlain Airport has been under municipal control for about sixty days. At that time, there were on the field three hangars owned by the National Guard, 109th Minnesota Observation Squadron, one by the Northwest Airways, operating mail express and passenger service between Minneapolis and Chicago, and a small hangar owned by the Marvin A. Northrup Company.

Since that time, the Midplane Sales and Transit Company has erected a modern all steel hangar 80 x 100 feet with a shop attached 60 x 18 feet, and office and waiting room.

Mark Hurd, vice president and general manager of the Midplane Sales and Transit Company states that his company is now contemplating the erection of an additional hangar. The Midplane fleet at the present time includes twelve planes—four Whirlwind Fairchild cabin planes, two Mohawks, five Travel Airs, one Command-Aire, and one Waco. The Fairchilds have been put into regular passenger service between Minneapolis and Fargo and additional service is contemplated. This company is conducting a school for pilots and mechanics in which so far 54 have enrolled as pilots and 24 as airplane mechanics.

The Marvin A. Northrup Company has under construction at the field a $25,000 brick and steel hangar 32 x 100 feet with an adjoining brick office 80 x 20 feet, the latter building containing office and workshop. It is planned to equip the sides of the building with chairs, tables and awnings to provide an outdoor resting spot for passengers and observers. In European countries, the air field has developed into an amusement park as well as an airport. Visitors come by the thousand, particularly on week ends to spend the day watching the flying.

A hangar of similar size and in every respect almost an exact duplicate will shortly be constructed by the Air Transportation Company, so that the hangar capacity at Wold-Chamberlain Airport by the end of the season will have been increased from three to eight.

St. Paul Municipal Airport

THE St. Paul Municipal Airport at the present time has one hangar 100 x 80 feet capacity which is filled practically to capacity. Important improvements are being made on the field—the North and South runway is being filled and widened to increase its length to 700 feet from 300 feet and the East and West runway is being increased from 300 to 1100 feet.

Daily attendance at the field runs from 500 to 1,000 while on Sundays and week ends the attendance on the field runs 3,000 or better. Passenger volume averages 15 to 20 on week days and runs as high as 150 on Sundays.

LANSING, MICHIGAN AIRPORT DEDICATED

MORE than 70,000 people witnessed the dedication of the Capitol City airport, Lansing, Michigan, July 14 and 15, and more than 50 planes participated in the two-day ceremonies.

The ceremonies opened Saturday, July 14, with the raising of a flag on the new 92-foot steel flag-pole, followed by short talks by Gov. Fred W. Green, Mayor L. J. Troyer and Charles H. Davis, ex-secretary of the chamber of commerce, the latter one of the main figures in the building up of the airport.

The first heat of the pony express race was the opening event on the flying program. A parachute jump by Sgt. Lucien Barr of the 107th Observation Squadron was another feature and Lieut. Eddie Preston, chief pilot for the SKF Air Service, Inc., of Lansing, and Walter Carr of Saginaw, furnished another real exhibition of aerial work when they flew two commercial planes over an allotted course, tied together. They took off and landed successfully without breaking the string.

The program ended Saturday with passenger flights at the airport and a lecture and motion pictures uptown by Capt. Sir George Hubert Wilkins, who with Lieut. Ben Eielson flew to the airport in their Lockheed Vega for the celebration. The members of the Michigan Aircrafters' Association met earlier in the day at the Hotel Olds for their business meeting and luncheon.

Sunday's program was a replica of that of Saturday with the finish of the pony express race and a dead stick landing contest. The pony express race was declared a dead heat and the prize money of $300 was divided equally among the following contestants: Willis Kysor of Niles, Randolph Russell of Battle Creek, and A. R. Narrin, Eddie Preston, Talbert Abrams, Claude "Buck" Greenfield and Arthur Davis, all of Lansing. Winners in the dead stick landing contest in their order were: Arthur Davis, Lansing, 8 feet; Claude Greenfield, Lansing, 10 feet; Russell Paulger, Detroit, 26 feet; Walter Carr, Saginaw, 48 feet; Eddie Preston, Lansing, 53 feet; Randolph Russell, Battle Creek, 59 feet; Russell Weist, Battle Creek, 82 feet, and Willis Kysor, Niles, 138 feet.

Luton S. Knowles and E. A. Goff, Jr., of Battle Creek, were judges and referees of the air meet. Following the close of passenger flights Sunday evening, Lieut. Eddie Preston flying a Stinson monoplane, and Arthur Davis, flying a Whirlwind Waco-10, gave an excellent exhibition of night flying.

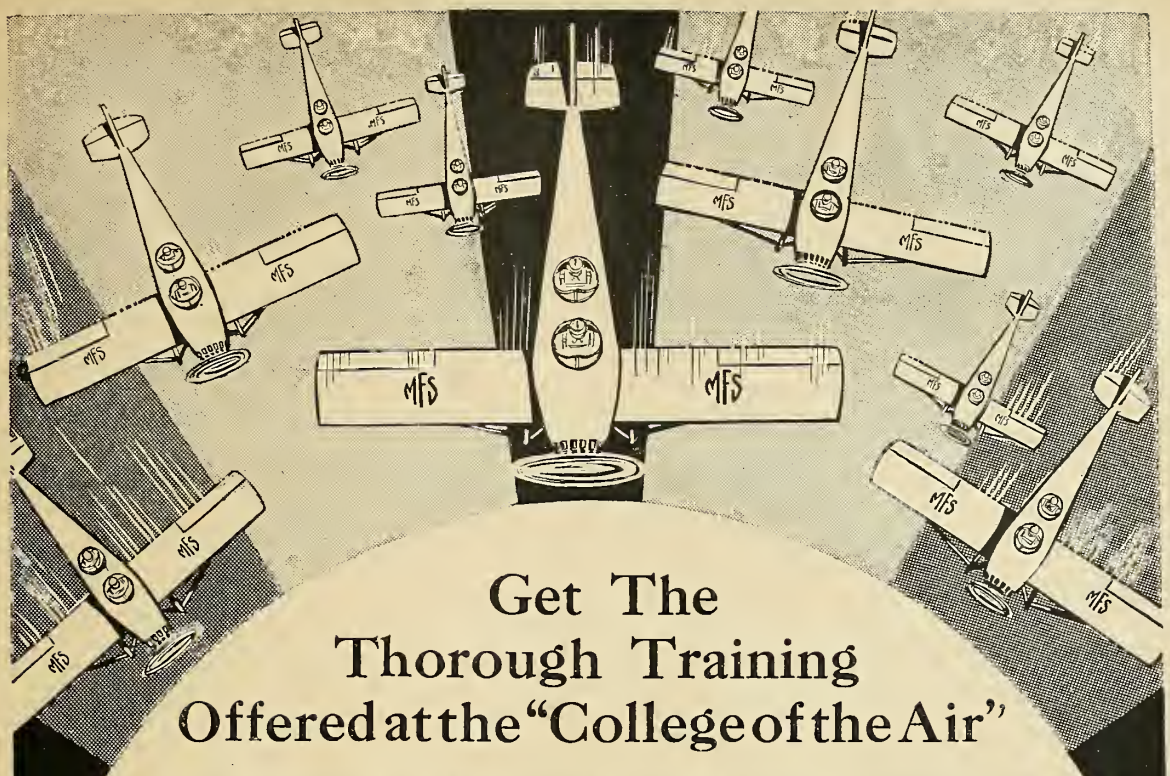
GRAND RAPIDS NEWS

FEW cities have approached the height of interest shown by Grand Rapids, Michigan, in connection with the inauguration of air mail service. The local Chamber of Commerce and Flying Club have actively promoted aviation for a considerable time. A good landing field has been laid out and fully equipped. Colonel Lindbergh was induced to include the city on his national tour.

Now comes the air mail to central Michigan, including Grand Rapids. The contract let to the Thompson Aeronautical Corporation insures daily delivery of air mail to and from Chicago, connecting with the transcontinental routes. The Chamber of Commerce devoted the July issue of its publication "The Spectator" to aviation, and local business men are being aroused to support the new service.

One of the underlying reasons for much of the interest shown by Grand Rapids in aviation is the importance of the Haskelite Manufacturing Corporation whose huge plant is located in Grand Rapids. This company was really put in business by the Government demand for aircraft plywood during the war. Waterproof glue developed for Haskelite proved so successful that it retained its place in the industry after the emergency passed, and today it is said that over 85% of the plywood used in planes comes from this Grand Rapids plant.

This company itself has taken an active part in promoting the use of air mail. Its main office, in Chicago, has used air mail exclusively to the Pacific Coast, all points west of Omaha and Kansas City, and very liberally to other points where time could be saved. Every effort has been made to call this practice to the attention of other business men and urge their similar adoption of air mail.



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NEW RECORD IS SET BY GLOBE CIRCLERS

AROUND the world in 23 days, 15 hours and 8 seconds is the new record made by Captain Charles B. D. Collyer and John Henry Mears. The former record of 28 days, 14 hours, 36 minutes, 5 seconds was made in 1926 by Linton Wells and Edward F. Evans.

Collyer and Mears took off in a seaplane from Pier A, the Battery, New York City, and caught the *Olympic* near Ambrose Light. Their Fairchild cabin plane, equipped with a 400 h.p. Pratt and Whitney Wasp engine, the *City of New York*, previously had been placed on the deck of the *Olympic*. Six days later they took off from Cherbourg and in six days more they had flown across Europe and Asia to Tokyo. Here they put their plane aboard the *Empress of Russia*, landing at Victoria, B. C. on the morning of July 21, and took off at once eastward across the continent. They stopped at Spokane for fuel, spent the night at Minneapolis, left Minneapolis at 5:47 A. M. July 22 (Eastern Daylight Time) and, flying in fog and storms most of the way, reached Miller Field, Staten Island, at 6:55:12 and their starting point, the Battery, at 8:21:48 P. M. July 22.

The globe circlers traveled 19,725 miles at an average speed of 840 miles a day. Fifteen of these days were spent on ships and eight in the air. By steamer they made 8,535 miles of the trip, and they flew 11,190 miles, averaging better than 1,000 miles a day in their plane. Their plane and engine functioned perfectly.

WRIGHT ENGINE SERVICE FACILITIES

APPROXIMATELY 2,000 Wright Whirlwind engines are now in operation in America and this number is increasing steadily. A comprehensive survey is being made of the entire country by the Wright Aeronautical Corp. with the view of establishing parts dealers and approved Wright service stations at all of the prominent airplane centers.

Three parts dealers have been appointed: Pacific Aeromotive Corp., Los Angeles, Calif.; Stout Air Services, Dearborn, Mich., and Air Associates, Inc., Curtiss Field, Long Island, N. Y.

About 18 months ago when the greatest part of the production of the Wright Company was being absorbed by Government contracts, service work on Wright engines in the field was well taken care of by the organization consisting at that time of Ed Mulligan, Ken Boedecker, Doc Kincaid and Andy Hufford. These four men together covered the country, taking care of the engines in service.

Within a little more than one year the Service Staff has grown from the group of four to an organized force of over 50 men, 16 constantly in the field, and 31 engaged in overhaul work at the factory, as well as an office force and correspondence relating to this important phase of the work. The Service Department is under the direction of Kenneth J. Boedecker, as service mgr.

PYRALIN USED IN CUBA-AMERICA AIRLINERS

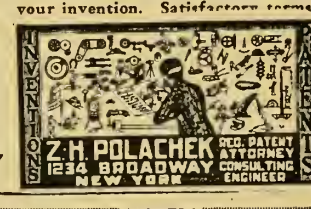
THE adoption of Pyralin window panes for aircraft is emphasized by the use of this material in the portholes of the massive flying boats of the Cuba-America Airline operated between Miami, Florida, and Havana, Cuba, and between Palm Beach and Havana. The new service marks the inauguration of the first regular schedules of travel by flying boats on international routes from the American continent.

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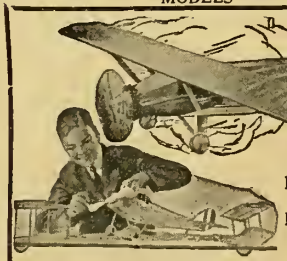
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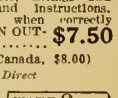
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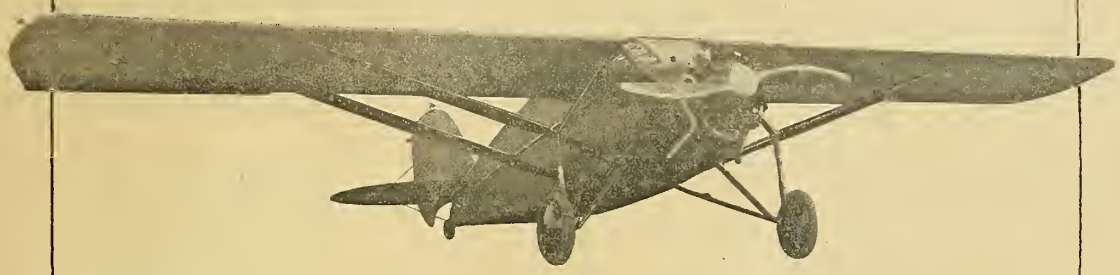
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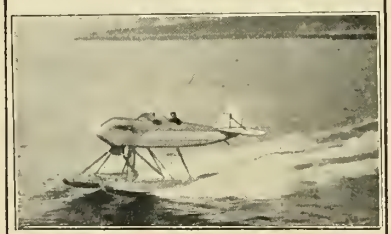
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COMMERCIAL AIRPLANE PERFORMANCE TESTING

A PLAN has been formulated for standardized performance testing of commercial airplanes by universities having recognized chairs of aeronautical engineering. This plan has received the general approval of the Aeronautics Branch of the Department of Commerce and of the Commercial Airplane Manufacturers Section of the Aeronautical Chamber of Commerce of America.

Some of the universities have already performed such tests and are in a position to render service along these lines at a nominal charge.

At a meeting of the Commercial Aircraft Manufacturers Section held recently in Detroit, the following committee was appointed to work with the Aeronautics Branch, the universities and others interested in the formulation and acceptance of a standard performance test under the auspices of the Aeronautical Chamber of Commerce of America: Walter Beech, Travel Air Manufacturing Co., Wichita, Kansas; A. J. Edwards, Prudden-San Diego Airplane Co., San Diego, Calif.; C. S. Jones, Curtiss Flying Service, Garden City, L. I.

Details of the plan will be worked out in cooperation with the following: Clarence M. Young, Director of Aeronautics, Department of Commerce; a representative of the Massachusetts Institute of Technology; Dr. H. Bateman, California Institute of Technology; Prof. E. P. Lesley, Stanford University; Prof. F. W. Pawlowski, University of Michigan; Prof. Alexander Klemin. Daniel Guggenheim School of Aeronautics. New York University, New York City.

NEW AVIATION MAP

RAND McNALLY AND COMPANY have published a new standard aviation map of the United States, designed for use at airports, in the offices or hangars of air transport companies, or any place where flights are planned or traffic routed, for the rapid computing of distances, directions, flying times, and rates. It possesses all the features essential to a general reference map of the country, is detailed but clearly legible, and in addition, the simple scale, small distortion, concentric mileage circles, and provisions for marking which make it an aviation map.

The map is 10 feet 2 inches by 6 feet 6 inches, drawn to the scale of 25 miles to an inch. It is drawn on a conic projection based on two standard parallels, shows all cities and towns over 1,000 population, counties, states, rivers and railroads. Each map is specially prepared with red concentric circles at 100-mile (4-inch) intervals around the point at which it is to be used. Every fifth circle is emphasized, and every circle marked in four places with its distance from the center. All maps are finished with a washable surface on which beacon lights, airports, routes or other data may be marked and easily erased or corrected.

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FOREIGN AERONAUTICAL NEWS IN BRIEF

Compiled from the foreign aeronautical press, the Automotive Division and the Transportation Division, Bureau of Foreign and Domestic Commerce

CANADA

Aviation in Canada During 1927

By C. P. C. Downman

AVIATION in Canada made great strides during 1927, according to a Government report just issued. Canadian fliers accomplished some remarkable feats, but their activities were along the lines of development work rather than spectacular transalantic flights.

Commercial companies more than doubled their flying time; the Provincial Government increased theirs by 50 per cent, while civil operations for the Dominion Government service increased in like proportion. The variety and range of the operations increased notably. The activities of Canadian pilots and aircraft range from observing for the sealing fleets off the Newfoundland coast and forest dusting in Cape Breton Island, to forest fire protection and fishery patrols on the Pacific coast; from air mail service to Pelee Island, the southernmost point of Canada, to the observation of ice conditions through the winter in Hudson Strait and transportation in the Yukon.

During the year, air mail service connecting the chief centers of population were considered seriously for the first time. Preliminary surveys and experimental flying were undertaken with a view to the establishment of service to hasten the delivery throughout Canada of the transatlantic mails. The Post Office Department, which for some years has given permission to carry mails by air to remote points, officially recognized the advantages of such services by awarding contracts for four winter mail services.

Increased activity has led to the establishment of flying schools by commercial firms, to fill the growing demand for pilots and air engineers. The Department of National Defence, to encourage the popular use and knowledge of aeronautics, is assisting in the establishing of flying clubs in the principal cities of the Dominion.

All these activities have had a great effect on the aircraft and engine industries. Existing aircraft factories have been fully employed, and are extending their workshops. Branches have been established in Canada by some of the best known British and American aircraft and engine builders. The increased demand for flying all over the country is reflected in the orders placed for new aircraft during the year. There have been delivered, or are due for delivery, for 1928 operations, no less than seventy aircraft of American manufacture. The great majority of these are modern, up-to-date types.

Perhaps the most remarkable feature of the year was the sudden demand for light aircraft. The Ontario Provincial Air Service took the lead in introducing these, and purchased four de Havilland "Moth" seaplanes for fire detection patrols in Northern Ontario. The satisfaction given by this new type led to its adoption for other similar work. The low capital and maintenance cost of light planes will ensure a great reduction in the cost of such services. At the time of writing, no less than seventy light planes are in use or on order for fire detection patrols and light transportation, in Ontario, Manitoba, Saskatchewan, Alberta and British Columbia, and for flying clubs and private use in all provinces.

The number of flights made in 1927 has increased considerably over 1926, the figures being: 1926, 4,755; 1927, 16,748. The hours flown have risen from 5,860 to 12,070, an increase of 106 per cent. The increase of passengers carried is particularly encouraging, showing the public is prepared to travel by air where facilities are offered. The figures are: 1926, 6,436 passengers; 1927, 18,932 passengers; 1926. 631,715 passenger-miles; 1927, 1,424,031 passenger-miles. In the same way, freight traffic has increased from 724,721 pounds in 1926 to 1,098,346 pounds in 1927. These figures do not include the Seattle-Victoria mail service of the United States Post Office, which carried 51,000 pounds of mail in 1927.

The operating records on the whole show increasing efficiency, due to the introduction of more efficient aircraft and engines and the greater experience of their personnel. There have been few accidents. Long and difficult flights are undertaken regularly.

IMPORTANT developments are anticipated by the Canadian Post Office Department in connection with the royal mail service. The Toronto, Ottawa, Montreal and Rimouski air mail system has proved so satisfactory that an extension of the aerial mails to serve other parts of the Dominion is regarded as inevitable. Meanwhile, definite plans are under way for the inauguration of a service between New York and Montreal and another service from Montreal to Albany. The Canadian Colonial Airways, Inc., of New York City, holds the contracts with the United States Government for the northbound trip and with the Canadian Government for the southbound trip. It is probable that steps will be taken to provide a service between Toronto and Buffalo and another between Toronto, Windsor and Detroit.

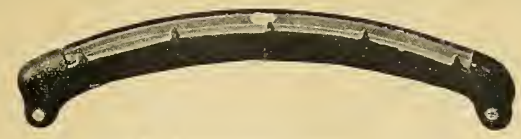
Another development of the future will be a service between Winnipeg, Calgary and Edmonton. The Department estimates a saving of twenty-four hours could be effected there as compared with railway time

BY the end of the season 15 flying clubs will have been established throughout Canada, according to advices from the Air Board. A total of $170,000 is being spent by the Board this year in the promotion by these clubs for civilian flying.

Clubs have already been established at Montreal, Toronto, Ottawa, Hamilton, Winnipeg, Saskatoon, Regina, Moose Jaw, Edmonton, Victoria, Granby and London, Ont. Under the plan of assistance two planes are furnished each club to start with. In subsequent years the department will duplicate planes provided by the club itself. A bond for the value of the machine and to guarantee observance of regulations is exacted.

(*Continued on next page*)





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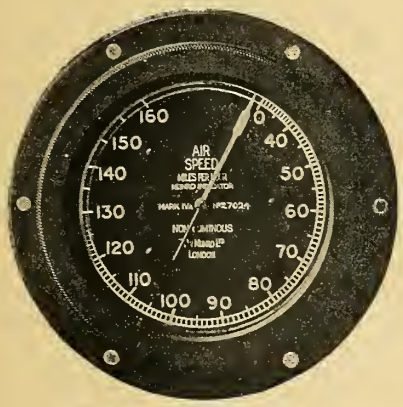
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(Canada News continued)

MONTREAL'S first aircraft exhibition, and the first also to be held in Canada, was formally opened on the evening of July 7th.

Major-General J. H. MacBrien, president of the Aviation League of Canada, officiated at the opening of the exhibition. General MacBrien is the former Chief of the General Staff, Department of National Defence, and is now managing director of the International Airways of Canada, Hamilton. Three directors of the International Airways of Canada accompanied General MacBrien from Hamilton, viz., C. Balfour, J. Young and R. O. Denman.

Mayor Camillien House and J. A. Wilson, controller of civil aviation, Ottawa, were other speakers at the opening, while W. S. Lighthall, president of the Montreal Light Aeroplane Club, under whose auspices the exhibition is being held, presided.

WHILE Canada has not sent any aviators across the Atlantic, it holds a world's record of its own, in that during the course of the past five years, this country has had 200,000 square miles of country photographed from the air, which is unique in the history of any country.

A. M. Narraway, second in command of aerial photography in Canada, announced this record to the automotive engineers in convention at Quebec recently.

Canadian airplanes, he stated, inventoried the forestry resources of the Dominion, while 200,000,000 acres were patrolled each year for forest fire protection. In addition 30,000 miles of timber limits, in supposedly inaccessible regions, have been discovered.

CANADIAN AIR NEWS

By James Montagnes

A FORD trimotor plane of the Canadian Skyview Lines has been taking up passengers at Niagara Falls this summer with a large number of visitors to the famous beauty spot taking advantage of seeing the falls from a new angle. Towards the middle of July the plane had carried 5,000 passengers.

TORONTO is to have two more airports, there being already two ports in use, the Dufferin field and the more-often used Leaside field where the Toronto Flying Club has its hangars. The two new airports will also be a considerable distance from the waterfront.

Aircraft, Ltd., will have a field on the Tretheway estate, near the Canadian Kodak Company's plant outside Toronto. The field is under a three-year lease now to the De Havilland Aircraft of Canada and will be shared by the new concern. President of Aircraft, Ltd., is D. G. Joy, while Hon. W. H. McGuire and Sir Frederick Stupart, director of the Meteorological Service, Toronto, are vice-presidents. Included in the directors are prominent Toronto citizens and Frank Tetheway, big mining operator.

The second company is the Canada Air Express, who paid $100,000 for a 100-acre area. Hangars are now being put up by these people, and a number of runways similar to the system used at Newark are being prepared on the field. The company is the first big commercial air company in Toronto and has already started work.

Another 100-acre field directly to the south of the present field is under option. Busses have been bought to bring passengers to the airport. J. H. Neill of Toronto is vice president of the company. Toronto and New York business men make up the board of directors.

WESTERN CANADA NEWS

By James McCabe

FOLLOWING acquisition of a temporary landing field by Vancouver city council on Lulu Island, members of the Aero Club of British Columbia, Vancouver branch, have requested the federal government to provide them with the two De Havilland "Moth" planes promised some time ago and the training of members will commence immediately.

B. C. AIRWAYS of Victoria have opened a Vancouver office to make arrangements for the opening of its circle aerial passenger service between Victoria, Vancouver and Seattle, which will open in a few weeks time.

FOR probably the first time in Canadian history, the government is arranging to pay the Indians their "Treaty Money" by airplane. Using a Western Canada Airways, Ltd., Fokker plane, piloted by Harold Farrington, Mr. H. N. Awrey, of the department of Indian Affairs, will visit eight of the Indian Reserves paying out the treaty money. This trip formerly consumed about three months travelling by canoe and it is expected that they will now require only about twenty days.

FRANCE

THE 1928 PARIS AERO SHOW

THE eleventh annual French International Aeronautical Salon opened June 29 at the Grand Palais, Paris in the presence of President Doumergue and hundreds of leading air officials and experts.

In the Aeronautical Chamber of Commerce of America's exhibit are included nearly twenty American firms. All kinds of aeronautical equipment are displayed, but no planes are shown. The Department of Commerce has supplied maps and materials, and photographs, literature and magazines give a bird's-eye view of the present development of aviation in the United States.

Although some of the large French firms are not represented at the show this year, fifteen interesting French exhibits are on display. Complete machines are shown by Bernard, Bleriot-Aeronautique, Breguet, C. A. M. S., Caudron, Farman, Hanriot, P. Levasseur, Lioré et Olivier, Morane-Saulnier, Mureaux, Nieuport-Delage, Henry Potez, S. E. C. M., and Wibault.

The German section, which shows the result of their concentration on the commercial phase of the industry, due largely to being barred by the Treaty of Versailles from manufacturing fighting machines, shows five completed machines—those of Arado (G. M. B. H.), Klemm-Daimler, Heinkel Flugzeugwerke, Albatros Flugzeugwerke and Junkers-Werke.

The Italian Air Ministry shows three machines—the Savoia-Marchetti S.55, a Fiat R.22 and the Macchi M.52 Schneider trophy type.

Czechoslovakia presents an Aero A.23 and an Avia B.H.33.

Two Fokker planes and an engine unit are exhibited by Holland.

Great Britain is represented by a full series of Bristol engines and a Bristol single-seater fighter, a complete range of Armstrong-Siddeley radial air-cooled engines.

A more detailed description of the aircraft exhibited at the 1928 Paris Aero Show will appear in a later issue of AERO DIGEST.

A MONUMENT to the memory of the members of the Lafayette Escadrille was dedicated on July 4 in the center of a private park at Villeneuve, Letang, near Paris.

The monument, which was made possible by the subscription of 10,000 Americans, is an arch about one-half the size of the Arc de Triomphe.

NOTES FROM FRANCE

By Joseph Agan

THE French Government is planning an important intension of intercontinental commercial aviation. The project envisages new lines reaching to Indo-China, Equatorial Africa and Madagascar. Part of the service will be effected in collaboration with British and Belgian companies.

The first line will be between Paris and Hanoi. It will be a prolongation of the present Paris-Bagdad route. The Bagdad Rangoon sector will be handled by a British enterprise which expects soon to reach an agreement with the Persian Government. The British section will include stops at Bassora, Bender-Abbas, Karachi and Calcutta. From Rangoon to Hanoi the service will be entirely French.

Furthermore, it is almost certain that a Franco-English-Japanese arrangement will be made to provide for regular aerial transportation between Hanoi to Tokio via Hong Kong and Shanghai. To this end, the Government of the Indo-China protectorate and Pierre Brunat, Director of Aerial Navigation, have been engaged in active negotiations with their future associates.

The liason between France and Madagascar will be effected in co-operation with a Belgian company now operating over a distance of 3,000 kilometers in the Congo. The French trans-Mediterranean lines at present are: Paris-Marseille-Tunis, and Paris-Marseille-Toulouse-Perpignan - Casablanca - Dakar. Another line between the capital and Algiers, via the Balearic Islands, will be opened soon.

From Dakar to Leopoldville over two alternate but not yet selected routes, the service will be operated by French pilots; from Leopoldville to Elisabethville by Belgians. At the latter point French machines will take up the trail to Madagascar.

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Span, Upper wing	31′ 2″
Span, Lower wing	34′ 1″
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Aspect ratio	6.20 ft.
Stagger	15″
Sweep Back	None
Dihedral, Lower wing	2½ dg.
Dihedral, Upper wing	None
Wing Area	310 sq. ft.
Airfoil section	Clark Y
Height Overall	9 ft.
Length Overall	25′ 5″
Weight, Empty	1340 lbs.
Wing loading	6.80 per sq. ft.
Speed, Maximum	99 m.p.h.
Speed-Cruising	85 m.p.h.
Speed, Minimum	35 m.p.h.
Useful Load	775 lbs.
Fuel Capacity	35 gal.
Radius, Max. speed	396 miles
Climb, Initial	600 ft. per min.
Ceiling	15,000

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GERMANY

Risticz and Zimmerman Break Duration Record

THE world's duration record was broken on July 7 by the German fliers, Johann Risticz and Hans Zimmerman. In the Junkers monoplane, the D-1231, a sister ship of the transatlantic *Bremen* and the *Europa*, they flew 5,034 miles over a circuit between Dessau and Leipzig, in 65 hours and 25 minutes, thus bettering the record recently made by the Italians, Ferrarin and del Prete, of 58 hours and 37 minutes.

Risticz and Zimmermann started their flight early on the morning of July 5 and with the exception of a heavy rain storm encountered on the second day up, the weather conditions were generally good.

The Junkers W-33 all-metal plane, equipped with a single water-cooled Junkers L-5 engine, weighed 7,920 pounds at the take-off. Of this amount 4,840 pounds was fuel —about 785 gallons of gasoline.



Risticz, Prof. Junkers and Zimmermann after the duration record flight.

ITALY

The Italia Disaster

WHEN the dirigible *Italia*, left Kings Bay, Spitzbergen, on May 23, for the North Pole, there were fifteen men in the crew: General Umberto Nobile, chief; Captain A. Mariano, pilot; Captain Fillippo Zappi, navigator; Professor Pontremoli, scientist; Dr. Finn Malmgren, Swedish meteorologist; Professor F. Dehounek, Czechoslovakian meteorologist; Lieutenant A. Vigilieri; Lieutenant Troiana; Lieutenant Ettore Arduino; Dr. Ugo Lago, Italian journalist; Giuseppe Biogi, radio operator; Natala Ceccioni, motor chief; Attillio Caratti, motorman; Vincennzo Pomelia, motorman; Calisto Ciocca, motorman; Renato Allesandrini, envelope attendant. A brief chronological narrative of the *Italia* expedition and rescue attempts follows:

The *Italia* reached and circled the North Pole on May 24, after 19 hours of flying. On the return trip, May 25, weighted by ice and snow, the dirigible crashed on the ice north of Spitzbergen, killing Vincennzo Pomelia and injuring General Nobile, Natala Ceccioni and Dr. Finn Malmgren. Eight men were left stranded with the wreckage of the cabin and seven men were blown away with the dirigible's bag. The fate of the men in the floating bag is still in doubt.

The men left on the ice divided to search for help. On May 30, Dr. Finn Malmgren, with the Italian Captains Mariano and Zappi, pilot and navigator, started to walk to land, leaving General Nobile and five men at the ice camp.

Meanwhile, the hunt for the polar explorers had begun with rescue ships, ice-breakers and airplanes. The Alpine Chasseur Captain Sora and the Dutchman Van Dongan proceeded on foot to the rescue. Norway, Sweden and Russia sent airplane expeditions to scan the icy wastes.

Messages were received from Nobile on June 8-12 giving their position and on June 14, the Soviet ice-breaker *Krassin* left Leningrad in search of the missing polar fliers.

On June 15, Dr. Malmgren, the leader of the party walking toward land, became too weak to walk and was left on the ice to die by his two companions, who were later rescued by the *Krassin*. The first account of this story, which has aroused so much indignation, said that Mariano and Zappi had stood guard over the dead body of Dr. Malmgren for thirty days. A different story was later reported to have been told by the Italians. They said that when Dr. Malmgren could no longer walk he insisted that they take what food there was and leave him to his fate, and that they, at his earnest pleadings, dug a grave for him in the ice and left him.

Captain Roald Amundsen with a crew of four Frenchmen and one Norwegian took off in a French seaplane from Tromsoe on June 17, and has not been heard from.

(*Continued on next page*)

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OPERATING STATISTICS ON EUROPEAN AIRWAYS FOR 1927

	Miles flown	*Passengers carried*	*Baggage and goods carried (lbs.)*	*Mail carried (lbs.)*	*Average daily mileage* (2)
Austria	245,043	4,274	134,117	3,745	1,220
Denmark	116,798	1,630	84,143	13,181	580
France	3,755,369	7,799(1)	2,354,269(1)	1,311,567(1)	22,500
Germany	5,921,593	102,681	3,225,595	1,057,812	33,000
Great Britain	873,000	20,344	1,456,000(3)		4,200
Italy	824,474	12,517	308,247	14,771	2,863
Netherlands	813,510	12,816	886,114	77,597	4,000
Poland	654,873	8,160	599,210	29,063	3,270
Sweden	206,766	14,069	167,893	15,428	1,300
Switzerland	459,720	10,823	235,828	103,588	2,300
Czechoslovakia	257,888	4,233	82,964	1,795	1,298
	14,096,034	199,369	9,599,340	2,628,547	76,531

(1) 1926, later figures not available. (2) Estimated. (3) Includes excess baggage and mails. (This table is subject to correction).

(*Continued from preceding page*)

The first successful effort to succor the marooned party headed by Nobile came from Italy, when Captain Maddalena in a Savoia plane circled over the camp and dropped food supplies, arms and ammunition to the stranded camp.

On June 24, Lieutenant Einar-Paal Lundborg, Swedish stunt flier, landed in his Junkers triple-motored plane, the *Upland*, at the Nobile camp and rescued General Nobile and his dog Titania, flying him back to the base. The next day Nobile was placed on board the *Citta di Milano*, the Italian base ship.

On Lundborg's second flight to the camp, his plane was wrecked in landing, but he was rescued by the Swedish flier, Lieutenant Shyberg, on July 6.

The Soviet pilot Chukhnovsky with a crew of four, took off from the *Krassin* on July 11 and sighted Captain Mariano and Zappi, but was forced to land on North East Land, from whence he directed the rescue of the Malmgren party by radio. On July 12, the *Krassin* rescued Mariano and Zappi, who had been without food for 13 days. Pushing on to the Nobile camp, the *Krassin* rescued five of the castaways. The next day the pedestrian rescuers, Sora and Van Dongen, foodless for three weeks, were found by the *Krassin*. And on July 15, Pilot Chukhnovsky and his crew were saved by the *Krassin*.

The six members of the *Italia's* crew who were blown away in the dirigible's bag and the six missing rescuers of the Amundsen party are still being sought. The world also awaits a more complete report of the ill-fated voyage of the *Italia* from the North Pole.

ENGLAND

NEWS FROM ENGLAND

By Edmund Hawthorne

AIR traffic between London and the continent has increased 50 per cent since last year. Fifty giant airlines are now entering or leaving Croydon airport daily, while on July 11 eleven planes were required to cope with the passenger traffic between London and Paris alone. Most of the voyagers are Americans.

ON July 6 and 7 the largest International Air Meet in England since the war was held on the identical field on which the first British Aviation Meet was held. While the majority of events were for civil aircraft, between 75 and 80 machines belonging to the Royal Air Force were in attendance and gave an attractive display.

The great German, Herr Gerhart Fieseler, famous for his "outside looping" and the Frenchman, Captain Doret, demonstrated their skill in the form of hair-raising stunts. Flt. Lt. S. N. Webster, winner of the 1927 Schneider Trophy, gave a speed demonstration on the Avro-Avenger, Napier Lion motor 450 h.p., attaining a speed of 200 m.p.h.

A NEW subsidy agreement has been made with Imperial Airways, Ltd., covering not only the present daily services on European routes but also a weekly service each way between England and India, to commence on or about April 1, 1929. The subsidy agreement will go into force also on this date. (*Continued on next page*)



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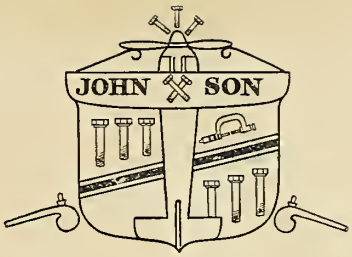
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Pedigreed—certainly with an ancestry of long use—by foremost builders and government contractors, with an heritage of reputation based on the severest practical flight conditions to which a bolt may be subjected, Johnson Bolts successfully shoulder the tremendous responsibility of holding famous airplanes together.

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Don't miss the National Air Races and Aeronautical Exposition — Los Angeles, Sept. 8-16th.

Quality

Chemical analysis——3½ nickel, .30 carbon (U. S. Aircraft Specifications), carefully controlled heat treatment, rigid inspection for strength, ductility, dimensions and finish. That's the quality which makes the small extra cost per plane negligible, compared to the terrific price of unreliability, unceasing care and frequent inspection. Any old bolt won't do. Quality counts.

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Johnson maintains a large and varied stock for immediate delivery, together with exceptional manufacturing facilities for making odd sizes on short notice.

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Is now ready, with a complete list of everything wanted by the airplane builder or maintenance shop. Send for it today.



Johnson Airplane & Supply Co.

Dayton, Ohio

(England News continued)

The through service to India will terminate at Karachi; but the Government of India has under consideration proposals for civil air transport services operating from Karachi eastwards which will connect with it. The maximum subsidies in respect of the services to be provided under the new agreement will be on the following decreasing scale: for each of the first two years, £335,000; for each of the next four years, £310,000; for the seventh year, £220,000; for the eighth year £170,000; for the ninth year £120,000; for the tenth (final) year, £70,000.

The maximum amount for each year will be allocated in definite proportions to the European services, the England-Egypt section, and the Egypt-India section.

LADY HEATH, accompanied by Miss Kathleen O'Brien, established a new altitude record for light seaplanes when, on July 10, they reached a height of 13,400 feet at the Rochester airdrome, London. The machine used was a Short all-metal "Mussel" with Cirrus engine.

CAPTAIN W. L. HOPE, for the second year in succession, won the King's Cup on July 21, in a two-day 1,000-mile air race around Great Britain.

Captain Hope, flying a Gypsy Moth airplane, averaged 105½ miles an hour over the whole distance. C. F. Uwins, flying a Bristol, was second, while Miss Winifred E. Spooner, with a De Havilland Moth, finished third after having led the field until the final lap.

As the event was a handicap competition this year, the speed was much lower than the record, which in 1923 was 149 miles an hour. Uwins, who finished second, was heavily handicapped and actually averaged 142 miles an hour for the two days of flying.

OVER 150,000 spectators, headed by King George and Queen Mary, witnessed the ninth annual air display of the Royal Air Force at Hendon on June 30. At this greatest and most spectacular flying event of the year, four new British fighters made their first public appearance—the Bristol "Bulldog" with Bristol "Jupiter" engine; the Hawker "Hawfinch" with Bristol "Jupiter" engine; the Boulton and Paul "Partridge" with Bristol "Jupiter"; and the Westland "Wizard" with Rolls-Royce; "Falcon XI," the only monoplane of this group.

The latest bombing plane, the Fairey "Fox" with Rolls-Royce; "Falcon XI," and a number of other British planes, took part in an air parade which included the huge Beardmore "Inflexible" monoplane with three "Condor" engines, a night bomber weighing over 15 tons fully loaded, and the Westland "Ptcrodactyl" with Armstrong-Siddeley "Genet" engine.

COLONEL THE MASTER OF SEMPILL was unanimously elected president of the Royal Aeronautical Society and Institution of Aeronautical Engineers for the year 1928-1929 at a recent meeting of the Council. The Master of Sempill was first Chairman of the Society for the year 1926-1927, and his term of office was subsequently extended by the passing of a special rule.

CZECHOSLOVAKIA

THE Czechoslovakian pilot, Major A. Vicherek, on June 6, is believed to have broken the world's record for distance and duration for light planes for 1,740 kms. in the light monoplane Avia B.H. 11 with a Walter 60 h.p. engine. The total weight of his plane was 770 kgs. and he carried 320 kgs. of gasoline and 30 kgs. of oil. Vicherek flew over the 100 km. enclosed course, Praha-Rip-Nové Benátky-Praha, twenty-five times without stopping—that is, 2,500 kms. in 19 hours 53 minutes 38 seconds, thus carrying away two world's records for distance and duration.

MEXICO

THE first Mexican air mail contract has been awarded to the Compania Mexicana de Aviacion of Tampico, a subsidiary of the Fairchild Aviation Corporation of New York.

The route, to be operated on a daily schedule, lies between Mexico City and Tampico via Tuxpan, a distance of approximately 500-miles over mountainous flying territory. Fairchild "All Purpose" cabin monoplanes will be used.

First class mail will be carried for 12½ cents for two-thirds of an ounce; preferred second class 25-cents per pound, and third and fourth class and parcel post mail for 37½ cents per pound.



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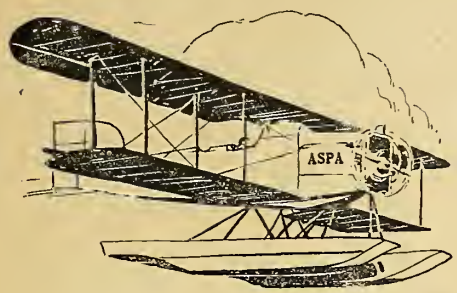
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The American Society for Promotion of Aviation was organized by 12 ex-service aviators at the Army and Navy Club, New York City, in 1925.

Our objects as incorporated are to "arouse and maintain interest in aviation" and eventually to

"MAKE-AMERICA-SUPREME-IN-THE-AIR"

We can accomplish our objectives by having a landing field or air port in every town, and by training red-blooded Americans in the art of flying.

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Battleships vs. Airplanes

Ever since its incorporation in 1925, the American Society for Promotion of Aviation, has consistently maintained that airplanes have proven their superiority over battleships and other naval armament.

We heartily endorse Mr. Cy Caldwell's articles exposing the manner in which the taxpayer's money is being wasted upon useless sea craft under the guise of National Defense, and ask all others who think likewise to join us in demanding that the same consideration—dollar for dollar—be given to Navy and Army Aircraft production as is now given to the building of battleships, Navy Yards, and fortifications.

You can participate in this great movement by becoming a member of THE A. S. P. A., and, as our representative, work for aviation in your community.

Join Aviation's Great Fraternity—ENROLL NOW!!!

MEMBERSHIP *fee one dollar which covers the cost of silver wings, membership card and literature of the A. S. P. A.*

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"Ask the Pilots Who Land on Them"

AEROL shock absorbing STRUT

THE FROLICSOME BATTLESHIP

(*Continued from page* 225)

Armoments ond the Non-Combatont, after quoting Mr. Bywater's statements and Admiral Niblack's remarks, comments as follows: "To my mind the foregoing does emphasize the ignorance which exists among naval experts and battleship enthusiasts on these points, which ignorance is, in itself, sufficient to explain their habit of consoling themselves, rather foolishly, with the idea that, in the future, battleships will either be able to dodge bombs or that they will be able to steer so devious a course that it will be impossible for an airman to predict their probable position after the half-minute or so has elapsed during which the bomb he is releasing is actually falling through the air. There is no denying the fact that naval experts and battleship enthusiasts believe, simply and wholeheartedly, that battleships can pursue such tortuous paths that it is impossible to predict their positions a minute ahead. Consistently, fanciful pictures are painted of enemy aircraft dropping bombs from great altitudes, the while the battleships they are trying to hit disport themselves merrily on the surface of the ocean, in a series of a delightful and bafflingly elusive evolutions."

But just how neat and speedy are these evolutions when performed by 33,590 ton battleships? Writing in the United States Naval Institute Proceedings for May, 1928, Captain O. L. Cox, U. S. Navy, states: "Practically all maneuvering of capital ships is done with a rudder angle such that it gives the ship a tactical diameter of 1,000 yards." The tactical diameter of the *Tennessee* is 700 yards with full helm and both screws turning forward. That is to say, in making turns with a battleship, although it can be turned in 700 yards, 1,000 yards is the usual diameter of the turn. In other words the ship moves 3,141. yards (or nearly two miles) in making a circle. Yet this is the ship of which Mr. Bywater, *prize novol essoyist,* states: "In the hands of a capable navigator it can be maneuvered as easily and surely as a yacht." Let us see if practical naval experience bears out Mr. Bywater's statement.

On the morning of June 22, 1893, the British fleet was proceeding to Tripoli, in two parallel columns, the starboard column headed by the battleship *Victorio,* the port column headed by the *Comperdown*—the two columns being 1,200 yards apart. The admiral of the fleet explained the maneuver by which the fleet was to take up position for anchoring. Briefly, the two columns of five ships each were to turn sixteen points toward each other. This half turn would exactly reverse their direction and leave them still in double column, but very close together. Now, the ships were 1,200 yards apart, which allowed each of the turning ships no more than 600 yards' tactical, or turning, diameter—and, as it happened, the tactical diameter of both the *Comperdown* and the *Victorio* was about 800 yards. In other words, the turning maneuver ordered by the admiral was quite impracticable. Yet, according to Mr. H. W. Wilson, in *Bottleships in Action,* "The signal passed down the two lines, and the fatal turn began. The *Victorio* and the *Camperdown* at the head of the two columns led the way. On board the *Victoria* the helm used was 35 degrees, the extreme limit possible, and when the ships had swung *but a very little distance* to port, it became evident that a collision was at hand * * * * A *very short time afterwords* both screws were put full speed astern, *but it wos now too lote. No power could overt the collision,* and the two ships drew closer and closer. The order for collision-stations was given by the ship's foghorn. *Four minutes ot the most* after the signal, the *Camperdown* struck the *Victoria* very nearly at right angles, just before the armoured breastwork which encompassed the base of the turret. The ram plowed its way in about nine feet. The water could be heard pouring into the ship below. The shock was tremendous, for the *Victorio* was forced bodily, sideways, a distance of seventy feet * * * * The water at once began to pour into the *Victorio* by the breach, which measured about 125 feet square."

The ship filled rapidly, and just ten minutes after the collision she sank with 321 men of her crew of 659. Among them was the admiral who had given the fatal order.

I offer the above as a comment on the battleship, which, the expert tells us, "can be maneuvered as easily and surely as a yacht." It does not seem so to me. *For four minutes* the screws of both ships *were owore thot o collision was inevitoble,* unless something was done to avert it. *Yet nothing could be done—with four minutes to do it in.*

(*Continued on next page*)

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scores an "assist" in this safety record

The Indian Lake Aviation Company, Russells Point, Ohio, writes that in 8 years they have carried more than 30,000 paid passengers without an accident, using Standard J-1 Airplanes rebuilt with HASKELITE reinforcing in the sides of the fuselage to the rear of rear cockpit and in the center section.

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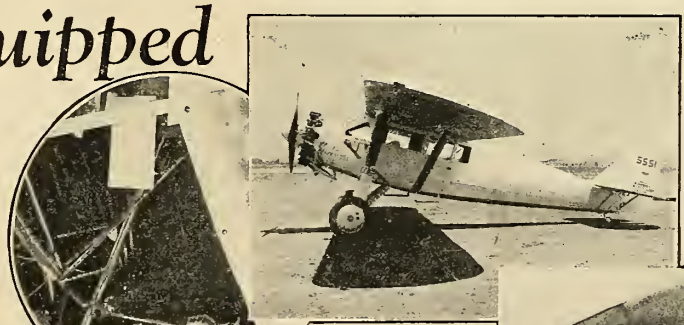
A.D. 8-Gray

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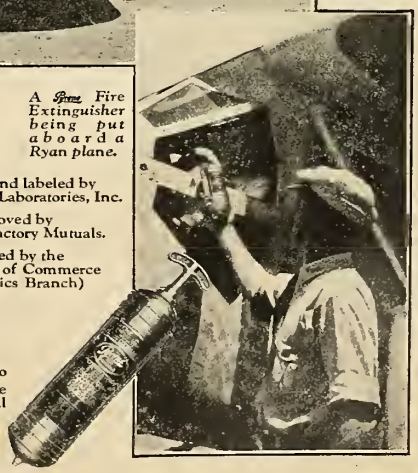
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Showing installation of Pyrene Fire Extinguisher in Pilot's cockpit on a Ryan Brougham.



A Pyrene Fire Extinguisher being put aboard a Ryan plane.

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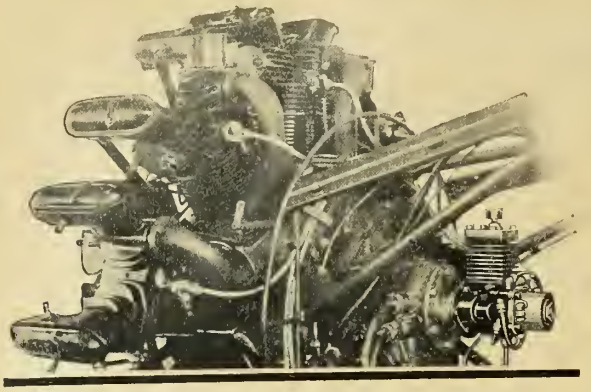
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(*Continued from preceding page*)

The great ship could not be stopped, nor could she be diverted from her course, nor could her swinging momentum be changed. Yet naval experts would have us believe that this unwieldy mass of metal, *unable in four minutes to avert collision with another great mass*, yet can *nimbly dodge about and elude a bomb* dropped from 12,000 feet in the short space of 28 seconds! The thing is impossible and would be laughable were it not for the tragic fact that the taxpayers of the United States are depending for protection in time of war on these unwieldy leviathans, which can neither protect themselves nor run away.

However, there is very little profit in pursuing further our inquiry into the dodging ability of a single battleship, for single battleships seldom are encountered in time of war. They work in squadrons, protected and supported by battle cruisers, scout cruisers, destroyers, and submarines. If dodge they can, then they must dodge *in company*. It will never do for every ship in the fleet to be poking its nose here and there, out of formation. If one turns *this* way, then the other must not turn *that* way. All evolutions must be performed in unison, after the manner of sheep crossing a road. To talk of battleships in action "travelling at high speed on an erratic course," as Mr. Bywater says that they will travel, is mere drivel. If they even attempt to perform such an absurd maneuver they will lose formation and gain confusion. Consider the effect of an ordinary maneuver of the Russian fleet at the Battle of Tsushima, on May 27, 1905, as reported by the naval historian, H. W. Wilson, in *Battleships in Actian:*

"Dim forms of other Japanese ships could be seen to the north, and Rojestvensky evidently thought the Japanese main force was approaching from that quarter. At 10 a.m. he changed from his cruising to his battle formation. So far his ships had been steaming in two columns, Nebogatoff with eight ships to port, and himself 1,000 yards to starboard with eight battleships in the second column. Between the two were the transports. Now he formed his twelve armoured ships in line ahead, placing the transports, destroyers and cruisers to starboard, which he expected would be the sheltered side." There was a short engagement with a Japanese cruiser squadron, which drew off. Then no Japanese vessels were in sight. "Rojestvensky determined to use the opportunity to change his formation, in the hope of springing a surprise on Togo (the Japanese admiral), whom he believed to be fast approaching from the north. The Russian admiral therefore attempted to deploy his line ahead into a line abreast, but when he was in the midst of this evolution, the mist lifted, the Japanese cruisers once more came into sight, and he knew that all his labor was vain. He annulled the order for deployment so as to get his ships back into line ahead as quickly as possible, but as the result of his action, about 1.45, the Russian fleet was in two separate lines ahead, Rojestvensky with his four battleships to starboard, and to port eight armored ships." Meanwhile the Japanese fleet under Togo came up on a course parallel to the Russian fleet, which was still endeavoring to take up battle formation. Wilson continues: "The Russian line was in considerable confusion. Rojestvensky's division, steaming two knots faster than the rest of his line, had not been able once more to take station at its head." In this condition the opposing fleets opened fire. "The confusion in the Russian line increased; the *Osliabia* had to stop to avoid collision with the *Orel*, and the ships to the rear of the Russian line *had to reduce speed or stop* as the consequence of Rojestvensky's unhappy mistake in trying to alter his formation at the last moment in the presence of a formidable enemy."

Now, there is an actual historical account of what happened when a fleet endeavored to alter formation in the presence of the enemy. What, I ask, would happen to the *American* battle fleet if *each individual battleship* went cavorting about on the surface of the deep, trying to avoid aircraft bombs? The fact that battleship speeds have increased since the days of the Russo-Japanese war only adds to the difficulty. Let us admit for the moment that the battleship exponents are justified in their belief that battleships can dodge bombs; and let us consider a few bombs dropped on a fleet in line of battle formation. From the battleship *Colorada* a bomb is observed dropping from an airplane 12,000 feet above. The keen-sighted battleship expert observes that the bomb probably will fall on the bridge, unless the speed of the ship is reduced enough to enable the bomb to drop ahead. "Full speed astern," is the order. Unfortunately, the eagle-eyed expert on the *Maryland*, only a few cables' lengths behind,

(*Continued on next page*)

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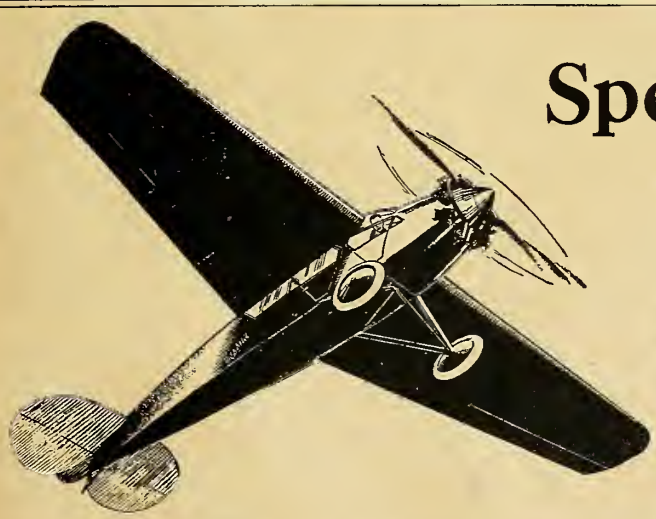
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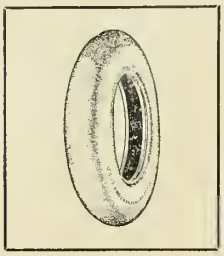
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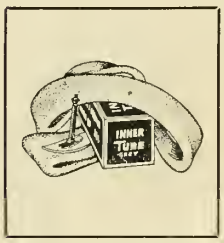


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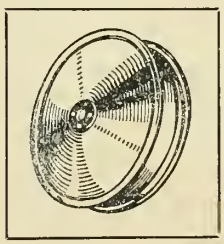


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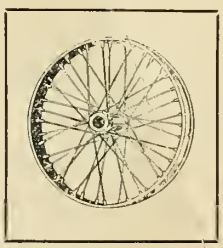
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(*Continued from preceding page*)

notes to his horror that a bomb has been released by another airplane above *him,* and that, unless his eyes deceive him, it will fall on the after turret. "Full speed ahead," he orders. Now, with the *Colorado* going astern and the *Maryland* going ahead, to dodge their respective bombs, it is only a question of minutes when they will collide. Or, as happened to the Russians—"the *Osliabia* had to stop to avoid collision with the *Orel.*" And if the *Colorado* and the *Maryland* have to stop in order to avoid collision, what has happened to the fleet formation? And what are the following battleships doing? Let us suppose they also are being bombed. Are they also going ahead or astern, or swerving from side to side, or, according to Mr. Bywater "travelling at high speed on an erratic course, and turning and twisting at high speed?"

But I have already shown that battleships cannot, by reason of their enormous mass, turn suddenly, stop quickly, or go ahead quickly; I have shown that battleships in formation cannot with safety get out of line, cannot move independently of the others; and I have shown that, not by expressing my own opinions, but by quotations from the writings of naval experts themselves. And I wish to state here that I pose as no expert on either battleships or airplanes—though I have flown airplanes since 1915. The information that I present in this article is available to anyone who cares to read the naval books from which I have quoted; it is available to any taxpayers who desire to learn something of the practically useless steel hulks, to support which they are being milked of hundreds of millions of dollars annually.

However, let us continue for the moment to suppose that the battleship can dodge bombs—though I am convinced that it cannot. And let us imagine a whole fleet of battleships doing that dodging at night. If the Russian line was thrown into confusion by a simple evolution *in daylight,* what would happen to it *at night* when an enemy aircraft squadron discovered it by dropping parachute flares and immediately started to bomb it? Picture the conditions: A dark night, no moon, only stars in the sky. The fleet is proceeding on a certain course, all lights out, exchanging directional signals by wireless. Suddenly the surface of the sea for a radius of two miles is illuminated by a parachute flare. The ships within that radius *are illuminated vividly,* while the airplanes, being above the light, *are invisible.* Bombs start to drop. It is of no use even to suppose that the bombs are visible until they are too near to evade; but the ships according to the best naval practice, will start "turning and twisting at high speed," Mr. Bywater assures us. Now, that is exceedingly dangerous at night. Orders from the flagship may be given, of course, to turn so many points to starboard, so many to port, so many this way, so many that way. But, with different tactical diameters, different helm actions, different bulks of the ships that will cause different degrees of loss of speed in turns—with all these things how long will it be before the *California* runs into the *Tennessee,* or as reported in 1905, when "the *Osliabia* had to stop to avoid collision with the *Orel?*" It seems to me that in a night-bombing action of airplanes against battleships that the battleships conceivably might sink as many of themselves by collisions as the enemy might sink by bombs. Furthermore, consider the confusion resulting in the formation when one or more battleships are hit, causing them to reduce speed, or if the rudder is damaged, to sheer out of line and become uncontrollable. Here is an incident from Jutland, described by Mr. Wilson: "In making the turn, the *Warspite's* helm jammed and she came sharply round to starboard, *all but colliding* with the *Valiant.* Before the helm could be got under control the *Warspite* described a great circle towards the Germans and passed between the *Warrior* and the line of German battleships, receiving a violent concentrated fire from six *Dreadnoughts.*" Just imagine the *Warspite* performing this evolution at night, while at the same time the other battleships are "turning and twisting at high speed!" It would almost seem that a battleship would be a poor craft on which to travel through the next war, if one really desired to travel all the way through.

Consider what actually happened in the British and German fleets on the night of May 31, 1916, when, according to historian Wilson, "There was a furious mêlée. The *Tipperary* was disabled at the very outset and began to sink. The *Spitfire* attacked the *Nassau.* Finally the *Nassau* rammed her small antagonist, blowing away the *Spitfire's* forward funnel and bridge with the blast from the heavy

(*Continued on next page*)

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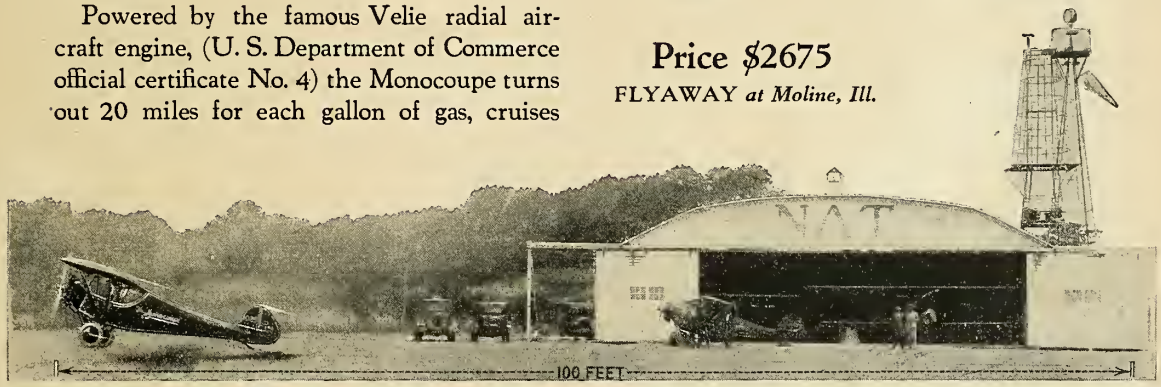
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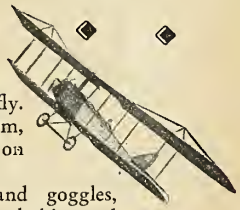
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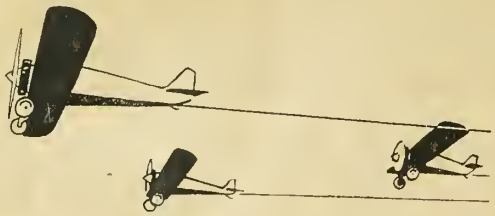
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(*Continued from preceding page*)

guns, but suffering in return extensive water-line injuries which lowered her speed to 15 knots. The *Posen* rammed the *Elbing* in the frantic confusion of the mix-up and damaged her so severely that *she was no longer able to maneuver.* The *Broke* rammed the *Sparrowhawk,* having been crippled in her steering gear by the German fire and the *Contest* also collided with the *Sparrowhawk.* The *Rostock* was struck by two torpedoes and *all but collided* with the German battleships, from injury to her steering gear."

Now, to all that confusion we will add, in the next war, Mr. Bywater's frolicsome battleships, "turning and twisting at high speed" as they endeavor to dodge bombs, aerial torpedoes, water torpedoes, and gas bombs dropped from aircraft flying two miles a minute! Will any naval authority inform me wherein I am wrong when I contend that in the next war, fought with modern aircraft, the state of any surface-going navy, if it seeks to dodge about, will be one of confusion worse confounded? Or does the Navy believe that battleships will be invisible at night?

General William Mitchell, whom I consider America's greatest authority on air warfare, writes: "Surface vessels are incapable of concealing themselves at sea even on the darkest night. They almost always leave a phosphorescent trail, white waves, or a 'slick', which are easily picked up." In addition to which I have indicated the use to which parachute flares will be put.

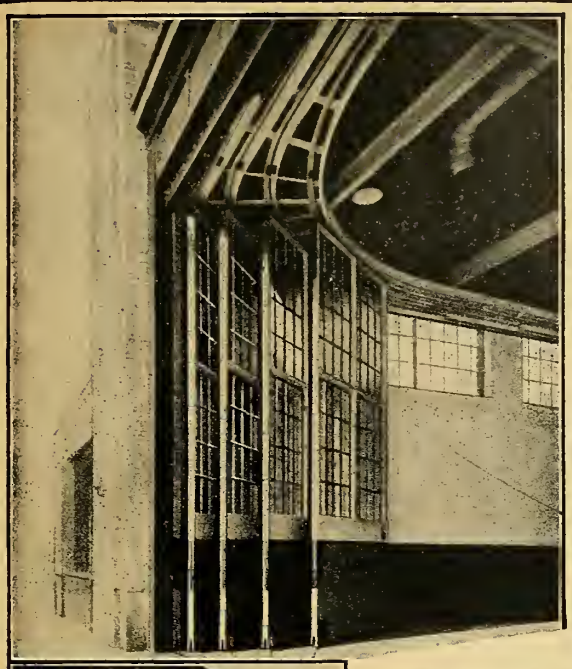
The destructive power of aircraft will be discussed in a later article and as we are discussing now only the maneuverability of the battleship no more than brief reference can be made to the destructive power of bombs. But I am impelled to quote further from General Mitchell, for he indicates the magnitude of the problem facing the battleship in the next war. "It does no good for a vessel to zigzag from a bomb *until after the bomb is dropped.* When attacked with large bombs that have a vulnerable area around them of probably 200 or 300 feet, the extreme slowness of a battleship, moving at between 20 or 30 miles an hour, makes it incapable of getting away. If a bomb hit between two battleships of a squadron in formation of single line ahead, *probably both would be put out of commission.* We do not yet know the maximum distance from which our one-ton or two-ton bombs can be dropped so as to bend the propellers, put the rudders out of commission, or destroy the condenser system, through the effect of the 'water hammer.'" I quote this opinion to suggest that in addition to the confusion of Secretary Wilbur's battleships, "zig-zagging if necessary, and so on," there will be added the confusion of battleships sheering here and there, out of control through damage to steering gear, propellers, "and so on," as Mr. Wilbur remarks.

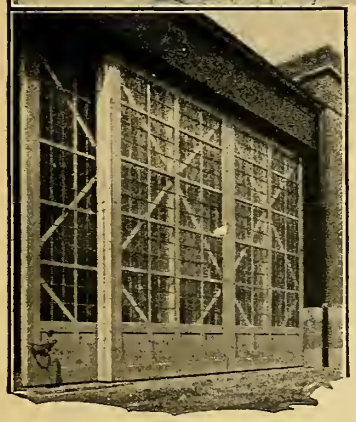
Despite the remarkable showing made by General Mitchell's squadrons of airplanes in bombing stationary battleships, the Navy still considers the battleship the backbone of the fleet, and is endeavoring constantly to belittle the powers of aircraft. Rear-Admiral Beamish, of the Royal Navy, states the battleship case as it would be stated by the majority of the United States Navy's senior officers. He says: "The idea that battleships would be sunk or destroyed, dispersed or frightened, or anything of that sort, by aircraft has no foundation in fact, or in experiment. It is not the slightest use putting the cases one hears of in which battleships are moored and a large number of active and keen young men armed with aeroplanes and heavy bombs go up to destroy them. *Of course they can do that,* but it is quite another story if a ship is steaming and thoroughly well armed with anti-aircraft guns. I, personally, should feel very comfortable if I were the captain of a battleship thoroughly well armed, and modern, against any number of aircraft."

It happens that after the Armistice tests were carried out on the British battleship *Moloyo,* to ascertain if torpedo-carrying aircraft could spot the ship and make any hits. Admiral Murray F. Sueter, in his excellent book, *Airmen or Noohs,* says: "Now, would Admiral Beamish have been really happy if he had been in command of the battleship *Molayo,* just after the Armistice, when she was attacked with aeroplanes carrying the locomotive Whitehead torpedo, and *our airmen secured seven hits out of eight shots; and this ship was not stationary or anchored, but was under weigh!"*

Despite Admiral Beamish's pathetic confidence in the battleship, how happy would he be in the next war if those torpedoes, instead of carrying dummy heads, as they did in the test, were loaded with

(*Continued on next page*)





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(*Continued from preceding page*)

their war-heads carrying 400 lbs. of explosive each? That would be nearly a ton and a half of explosive placed at different spots along the ship's sides—enough to sink any battleship in the world. And furthermore, imagine those torpedo-carriers operating in the night engagement I have described above, operating by the light of the parachute flares, while bombers also contributed their share! How happy would Admiral Beamish be in those circumstances? What use would his armament be when he could not see his targets until they were nearly upon his battleship? But the whole question of armament will be discussed in the next article, and therefore plays no part in this one, which is concerned solely with the task of discovering just how nimbly the battleship can evade aircraft by dodging about on the ocean.

The *Malaya* could not avoid them at all—seven out of eight shots hit the ship. And the *Malaya* was in motion and *was expecting the attack*. Nor will any other battleship be able to twist or turn or dodge bombs or torpedoes rained from aircraft in the next war. It will be sunk.

It may be asked: Why are not experiments carried out in the United States Navy to determine whether or not battleships in motion can evade dummy aircraft bombs and torpedoes? The answer is that the High Command of the United States Navy *will not allow such tests to be carried out* because they know full well that the results will prove what I contend, and what General Mitchell contends. And that is, that the battleship as a weapon of defense is hopelessly obsolete, that it cannot avoid the attack of aircraft, that it cannot remain afloat under determined aerial attack, and that it cannot protect itself by any means in its power—not even by the few aircraft it carries on its deck.

The High Command of the Navy are men in jobs. If they admit that the battleship is obsolete and should be scrapped, then their jobs are gone, and they are out in civilian life on half pay. They cannot, at their age, fly airplanes or do the necessary administration work, for they know nothing about it. They do not know how a squadron of bombers should be handled, how a squadron of fighters should attack; they do not and cannot understand the men who fly. Therefore they oppose everything that is of the air; they fight with all their power to retard air development and keep the battleship as the backbone of the fleet. They do it simply because they are old seamen, knowing the sea and nothing but the sea. They do it because they are simply men in jobs, doing their utmost to protect those jobs, long after the necessity for them has passed away.

AIR—HOT AND OTHERWISE

(*Continued from page 226*)

the world. But he helps youth, and his associates help youth, and the general impuse to help youth pervades Detroit.

The Ford enthusiasm with regard to aeronautics vibrates in Detroit and is augmented, backed up, helped and doubtless stimulated by a similar spirit in the hearts and minds of many other men. Aeronautics has captured Detroit—which is why Detroit so obviously intends to capture aeronautics and make itself the greatest air center in the world.

One hundred and seventy-five thousand people were on the field when the balloon races began. The First Pursuit Group of the Army Air Corps came over from Selfridge Field and put on an air circus by comparison with which Barnum's, Sells Brothers, and the Ringling's little entertainment look like sideshows.

Griffith Ogden Ellis, the publisher of *The American Boy*, and members of its staff, including George Pierrot, Merrill Hamburg, Franklin Reck and others were on hand too.

The importance of the model airplane contests is indicated by the fact that practically everyone of real importance in modern American aeronautics was a model flier when a boy. This certainly is true of "Bill Stout, "Dick" Byrd, Clarence Chamberlin, Eddie Stinson and so many others that their names would read like a long roster of the leaders of American aeronautics.

No one possibly could prophecy how much that particular group of boys which was gathered at Detroit on this occasion will mean to the air effort and progress of this great nation's future.

Every committee that had anything to do with this great series of events did its work with competence and a completeness not to be excelled.

(*Continued on next page*)

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(Continued from preceding page)

The interested capitalist, the technician and the flier were joined by men of outside interests—all sorts of outside interests, in that magic city of Detroit—businessmen, professional men and many women—with hands clasped in coöperative effort as they always are when Detroit wants to do anything in connection with aeronautics.

I am stating a simple fact when I say that that visit to Detroit gave me, personally, my most inspiring experience.

And the sun no sooner had set on that day of days in 1928 than these wonderful Detroiters were making plans for 1929.

The American Army entry won the balloon race, which gives the Gordon Bennett Trophy to the United States permanently. Ah, that was bad—to the Detroiters. It would take some of the joy out of ballooning. It is contrary to the spirit of the motorcar metropolis to sit back, calmly triumphant, and grow stale and fat and stodgy, like a retired general of past wars. It wants new fights continually.

So, instantly, they started plans for the creation of another Gordon Bennett Trophy and contest which will keep the interest going.

Detroit never wastes a moment, and so, ere they adjourned, these energetic men had decided to ask all the artists of all the nations which ever have competed to create and submit designs for the new prize.

And there will be a Fifth National Air Tour, and a second National (and maybe International) Model Airplane Contest.

The only thing which will keep me away from Detroit upon any similar future occasion will be a wooden box, with a silver plate, under six feet of my country 'tis of thee. If and when I am thus inconvenienced, it is my prayer that Frank A. Tichenor, Jr., who was with me at this show, will be at that one in my place.

SECRETARY of War Davis has ordered General Fechet, Chief of the Army Air Corps, to make a report on the use and value of lighter-than-air craft in the United States Army. General Fechet has been asked to make recommendations regarding the development required for lighter-than-air, including data as to the present status of equipment, personnel and organization and right here begins a tale that starts in the committee rooms of the last Senate session.

The Senate gave the Army Air Corps $13,000 with which to work out its lighter-than-air problems during the coming year.

Note the sum. Remember that this is the United States. Remember what the Zeppelins did to London during the World War, and then let your comment on this action of the Senate be in a whispered voice. The children should not be taught to cuss—

In the great international contest for supremacy in child's play we (acting as the judge) unhesitantly give the booby prize to the United States Senate for this achievement in handling the Army's lighter-than-air situation.

The sum asked for the Army Air Corps in the Army Appropriation Bill was in keeping with its previous economical lighter-than-air program. Here it is:

2 Balloons, observation, 50,000 cu. ft. capacity at $6500..	$13,000
1 Airship envelope RS, 740,000 cu. ft. capacity	78,000
1 Airship RN, complete, 300,000 cu. ft. capacity	75,000
2 Blowers for TC airships at $500	1,000
1 Water recovery apparatus, RS airship	5,000
4 Damper valves for TA airships at $250	1,000
1 Airship envelope, TF type, 50,000 cu. ft. capacity	10,000
1 Airship envelope, TE type, 80,000 cu. ft. capacity	15,000
Transportation	2,000
Total	$200,000

But it was peeled down from $200,000 to that startling multiple of the traditional unlucky number 13 by these great legislative experts who through some curious accident, have managed to get into the upper legislative house of this more or less intelligent Republic.

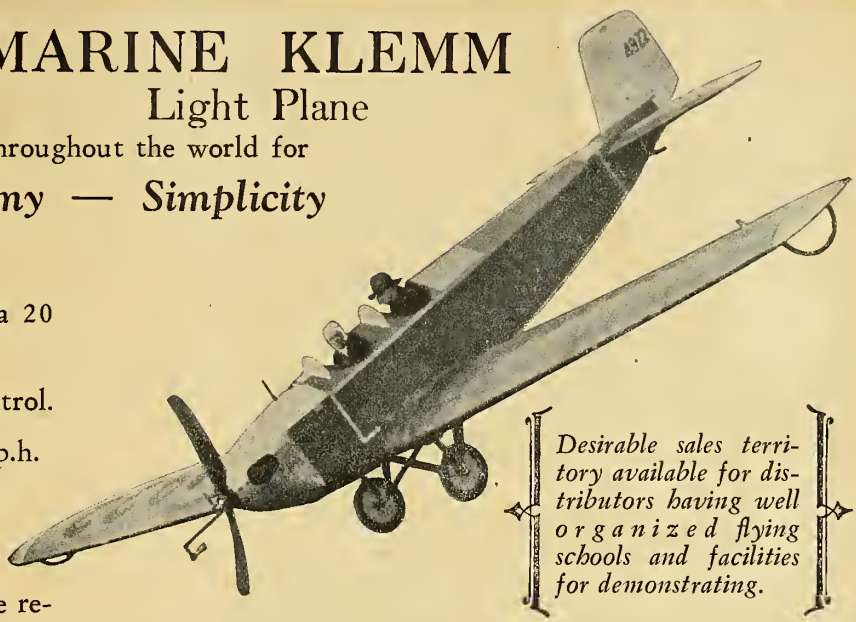
Opinion may justifiably differ with regard to the necessity for the existence of greater lighter-than-air facilities, as far as war needs go, but lighter-than-air is a vastly important branch of aeronautics, none the less, and one in which the United States cannot afford to lag behind the world.

(Continued on next page)

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DETROIT

(*Continued from preceding page*)

So with the thought of really finding out what lighter-than-air amounts to in this country the Secretary of War has directed General Fechet to make a detailed study of the subject and report upon it. As soon as this study enables him to reach conclusions Fechet will make recommendations which will undoubtedly be used to educate the Senate when it reconvenes in December.

It is obviously silly, even ridiculous, for Congress to authorize the existence of a Department in the Army for which it refuses to supply maintenance funds, but if any pretense is to be made of having such a department, no program could be more conservative and economical than that submitted by the Army Air Corps. Therefore the small amount requested should have been given or the whole thing crossed out.

If the Army is to be virtually excluded from lighter-than-air effort, as the reduction of its appropriation to $13,000 would indicate that the Senate thinks it should be, then a law should be enacted so that the whole thing may be turned over to the Navy, where Willful Wilbur, champion cabinet curio and Steel Trust darling, may play with it. We suggest this, as a matter of fact, for balloons of tissue paper once delighted our own boyhood on Fourth of July evenings. Willful Wilbur is an artist in the use of paper, so he could make the bags, which his Admirals could never failingly supply exceedingly hot air with which to inflate them, thus saving the taxpayer all cost of gas, helium or otherwise.

A reading of the hearings discloses the fact that Senator Dineen of Illinois was not on the job and looking after the interests of his own State, wherein Scott Field is located, but inasmuch as he was in the midst of a campaign to beat "Big Bill" Thompson, of Chicago (certainly a legitimate work of national defense) we can't criticise him too severely. So the Senate as a whole must bear the blame.

An examination of the amounts requested shows that the Senate actually appropriated exactly what was asked for 2 balloons 50,000 cubic feet capacity at $6500 each. A $13,000 lighter-than-air program and this is the United States where we are going to spend eight to ten millions of dollars before November 6th to elect a President!

MY AERIAL VACATION

(*Continued from page* 222)

oldest daughter has a bosom friend in central Illinois and all the boys want to see some Indians. We put a red ring around each choice, and by the time we were through the map looked as if it had measles.

I called a halt. "We can't go to all these places," I said. "To do so we should have to spend about six months on the train, and you know that time-tables give me a headache. I think we had better go to Cape May after all."

"Wait a minute," cried the Head of the Family. "I have an idea. You're in the aviation business, aren't you?" I wriggled a little uneasily and admitted that maybe I was. "Then," said she triumphantly, "we'll go by airplane."

"We have no airplane," I protested feebly. "We'll buy one," said She-Who-Must-Be-Obeyed, "and at the end of the trip we'll trade it in for that touring car you've been promising me for the last five years. And since you are so well known in the flying business, I'm quite sure you can get all the gas and oil you want free. Look at Lindbergh,—I bet he never pays for gasoline. The trip won't hardly cost us a cent, and we can go everywhere we want."

I struggled, but it was no use. The boys were already outside, telling the neighbours that their daddy was going to buy an airplane. My wife was writing to her aunt in St. Louis, and the girls were calling all their friends on the telephone and telling the news. The Rose family was going to buy an airplane and make a National Endurance Tour by air.

At the next session of the convention I reported that the trip was all off. I had read all the advertisements in AERO DIGEST, and there wasn't a plane on the market that would take care of our family on such a trip. The only possibility was the new British gas bag, which wasn't ready. We should have to go to Cape May after all.

"Can't you design an airplane?" asked the 19th Amendment.

"I don't know," I modestly replied. "I've never tried."

"Well, you sit right down and try," said she. "We'll make a sketch

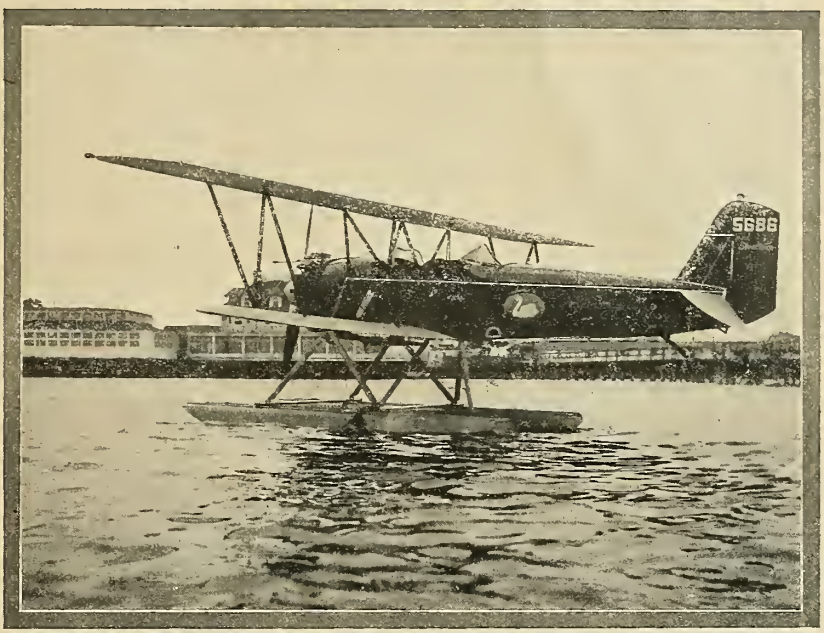
(*Continued on next page*)

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Riding at a buoy at a Summer Resort, ready to start on a moment's notice, this Stearman Seaplane clearly illustrates the advantages of Seaplane operation. Five minutes in a row boat, or two minutes in a motor boat take you from the shore hotel to the Seaplane. Untie the mooring rope, turn the crank and off you go anywhere within 400 miles radius.

From the same summer resort you would have to motor an hour to get to the nearest flying field. An hour on crowded, dusty roads on a hot summer day!!! And then you have to think about the dangers of forced landings, to worry about the place to land, to worry about getting to your destination from the place you will land in.

There are no such worries while flying a Seaplane. There is always a level surface of water under you, to land in case of engine trouble. There are plenty of excellent harbors along Seashores, on the lakes and on the rivers. From time eternal people settled near water, and now most of the large cities are found to be on rivers, lakes or Seashore. You can hardly imagine a Summer Resort without water. And everywhere, where there is water, you can fly in a Seaplane.



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Department AD8

AVIATION SERVICE & TRANSPORT, Inc.
203 N. Wabash Ave.
Chicago, Ill.

(*Continued from preceding page*)

of what we want and have the plane built to order. I'm not going to give up this trip just because you are too obstinate to take a little trouble over it."

I have always rather fancied myself as an aeronautical designer. I have, in fact, a number of rather valuable ideas roughly worked out which I expect to dispose of someday to an enterprising manufacturer. There is, for example, the Rose Folding Wing, which can be folded in flight to cut down air resistance or when landing in a small field. There is the Rose Square Wheel for undercarriages, which permits a plane to land safely on a department store roof. There is the Rose Vertical Skid, which works equally badly in all directions, and the Rose Reversible Propeller, which permits the ship to be backed out of the garage. And then there is the Rose Aerial Brake. I have made a careful study of air hazards, and have discovered that practically all fatal accidents and serious damage are caused by the fact that airplanes go too fast. So I have worked out this brake, which is attached to the tail and opens up something like an umbrella. When I have figured out a way of getting it shut again it will be practically perfect. Above all there is the Rose Helicopter. This is based on a new and absolutely exclusive idea of mine that it would be a splendid thing if an airplane could rise straight off the ground and come down the same way, gently, of course, and right side up. Please don't mention it to anybody, since there are still a few details to be worked out, and I don't want one of these big soulless corporations to steal my brain-child from me.

So I took rather kindly to my wife's suggestion. I sent one of the boys up to the nearby airplane factory and borrowed a T-square, a pencil, some aerodynamics and a handful of dihedrals, and went to work.

My wife has helped me a great deal. She has selected a name for the ship. It is to be called the Rosary, which is a nice snappy name, though in this case it has no religious implications. She has also decided on a color scheme; the wings will be old rose, the fuselage pale blue, and the rudder will brighten everything up with a dash of cardinal red. The wheel spokes will be beige, the tailskid mauve, and the struts of the undercarriage nude. The interior will be upholstered in serviceable mohair, with lace curtains at the windows.

There will be a trailer. We have nine children, five boys and four girls and if you don't believe it you may count 'em, and there simply has to be a trailer. I tried to get eleven seats in the cabin, but it couldn't be done, though I tried pairing them and staggering them and piling them on top of each other. Between the trailer and the ship we shall string clothes-lines on which to dry the baby's spare tires. The boys want to take the dog and the rabbits, so there will also be a sort of caboose out behind the trailer.

The engineering details are rather ingenious. The motor is out in front, where the children can't get at it to fool with it. The controls are at the very rear of the cabin so that there cannot possibly be anything but rear seat driving. The rudder control is reversible, so that if one foot gets tired you can switch to the other. The fuselage construction can be worked out in wood or steel tubing, or embroidered on a sofa-cushion. The aerodynamics are kept under the driver's seat.

We had considerable discussion about baggage space. I felt that some space should be allowed for gasoline, but my wife insisted that we should need it all for baggage. As far as I am concerned, baggage is no improvement to a vacation. It is eternally in the way when you do not want it, and it crawls away and hides the moment you need a clean handkerchief. Its presence or absence afflicts you throughout your trip; it takes toll of your temper and pocketbook at every hotel, frontier or change of trains, and it runs ahead of you or behind you with all the perversity of a small dog out for his morning walk. It is particularly vicious on a sea trip. By the time you stagger on to the ship, exhausted by your arguments with officials and from folding and unfolding your passport, you have already given your trunk up for lost and are contemplating with some satisfaction the collection of your baggage insurance. It is therefore small comfort when you crack your shins on it as you enter your cabin and reach blindly for the electric light switch. By Herculean efforts you get it under the berth, at which moment you recall that it contains your field glasses, camera, and birth certificate, and you must therefore get it out again, hanging on the ceiling while you unpack. When you get to Europe you spend most of your time unpacking and re-

(*Continued on next page*)



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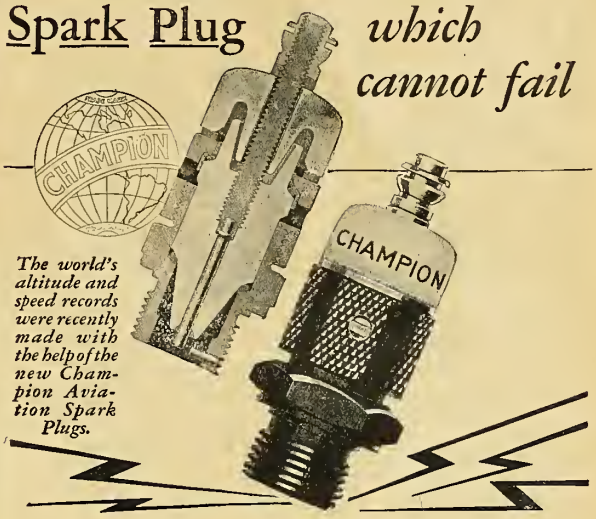
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A Non-Profit Organization

(*Continued from preceding page*)

packing it, and when you get back the customs inspectors throw it all over the dock, and altogether it puts a blight on your whole trip.

However, my wife had her way, with that gentle persistance which won her to me in the first place, and I put in a sort of attic, with coathangers and hooks and a cedar chest for blankets and the children's winter coats. In return she allowed me space for a small buffet, in case we should happen to be flying over Canada or Mexico and should want to observe the customs of the country.

There was quite an argument about my camera. I was willing to leave the camera at home, since I have had experience in travelling with a camera. If you want to learn something about the force of gravity and the indestructibility of matter, take a camera with you on your next trip around the world. Don't take one of those vest-pocket machines which make your vest look like the Rocky Mountains; take a real one. When you leave home your camera will be little more than a gesture slung across your shoulder, like your fountain pen and pocket knife and the travel diary you expect to keep. But inside of a week it will be a ball and chain. Its weight and bulk will increase as the square of the distance, and the less you need it the more obvious it will become. While the other members of the party are playing happily around with the beauties of art and nature, you will be bowed to earth with an encumbrance of machinery. Your camera will become as useful and convenient as a third leg, and equally difficult to get rid of. You will be in perpetual dread of losing it but will have no such luck, particularly if it is insured. Occasionally you will shoot it off, but the only people who will get any real satisfaction out of it will be the Eastman Kodak Company, for all your mountains will look like molehills and your buildings like first cousins to the Leaning Tower of Pisa. You will also attack the other members of your caravan with it, and promise prints to numerous people that you hope never to see again. When you get home you will have a lot of pictures that nobody wants to see, and your camera will be hopelessly pickled by sun, sand and salt water.

I mentioned these points to my wife. "But," she protested, "you will want to take some aerial photographs. I think aerial photographs are too cute for anything."

Well, I have had some experience in taking aerial photographs. I had borrowed an aerial camera, weighing about a long ton and decorated like a cookstove with knobs and handles and triggers and doodads. I wanted to see if it would work. Jim Ray took me up in a dual-control job, with himself in the front seat so that he would not see me suffer. Now on all my previous excursions the pilot had treated me carefully, taking three miles to turn a corner and apologizing every time he hit a bump. But I soon discovered that this was a business trip. Jim saw a picture below, turned the corner on one wing, throttled the motor and flopped the ship to an angle of sixty degrees too much. I scrambled over to the other side of the cockpit, having lost my head, my helmet, my sense of humor and my appetite all at once, and almost parted company with the camera. Recovering, I shook my head to show I didn't care for that view, and Jim went zigzagging around looking for another. Whenever he saw one he would tilt the ship sideways until I was looking down somebody's chimney, and wave to me to shoot. At last I gathered myself together and began pulling the trigger. I had a magazine of twelve plates, which I knew would be plenty. After I had taken six, I discovered that I had forgotten to take the slide out, but I didn't mention it at the moment. I took it out and went on shooting. I shot a school, I shot a church, I shot the whole dizzy landscape. Finally I realized that I was about to shoot my lunch, so I flagged Jim that the day's work was done and we went home.

Of the six pictures, the first is a very fine study of the lower right hand wing and part of a strut. The second doesn't show the strut. The third is blank, but the fourth shows a church and school all mixed up in a most surprising manner. The fifth is uncertain, but experts have declared it to be a very fine aerial map of the battle of Chateau Thierry. The sixth, as far as can be determined, is a study of a bowl of vegetable soup.

So I declined to take a camera, and instead we put in a bridge table and a cocktail shaker .

The best part of my design was the instrument board. In addition to the regular instruments it shows a can-opener, bottle-opener,

(*Continued on next page*)

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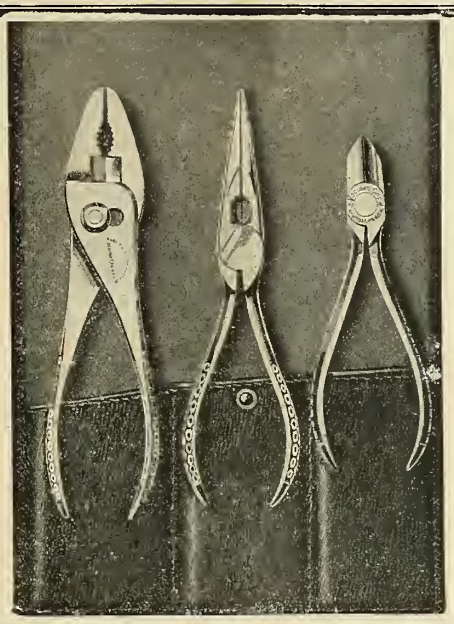
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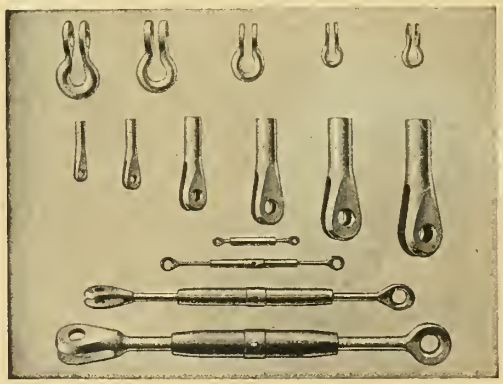
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(*Continued from preceding page*)

cigar lighter, corkscrew, intercommunicating telephone, egg-beater, pencil-sharpener, mirror, and a slot for used safety-razor blades. There is also one of those useful little tools for taking the stones out of a horse's hoof, like they have on pocket knives.

I sent my completed design up to the factory, with a request that they give it their earliest attention and keep the cost down as much as possible. I said I might be willing to go as high as three thousand dollars, provided that nothing but the best materials and workmanship were employed. This morning I received a letter, acknowledging my order of the inst., and stating that they were unable to guarantee delivery before March 1, 1929, but would positively have the ship finished by that time.

But I ask you—what sort of a time is that to take a vacation? We have had another family conference about it, and we are going down to Cape May tomorrow morning at 4:15, eastern standard time.

THE FLIGHT FROM ITALY TO BRAZIL

(*Continued from page* 237)

This was at 3 o'clock in the afternoon and they were flying at 12,000 feet. The first land they saw they learned later was Cape Rocco. They came down for a better look but clouds were gathering and when they flew over the land it was completely covered. They proceeded down the coast toward Bahia by compass hoping to stretch their already record breaking flight to Rio de Janeiro. The weather however, grew steadily worse and after flying for an hour and twenty minutes without a chance to take their drift or get a bearing from the coast buried in fog and clouds they decided to turn back and seek a landing at Port Natal where last January the Frenchmen, Costes and Lebrix, landed under much the same weather conditions.

Gradually they worked their way through the clouds and feeling their way they found Port Natal but were unable to locate the landing field which lies behind treacherous hills some fifteen miles to the southeast of Port Natal. Their fuel supply nearly exhausted they realized that something must be done and that quickly. Near the little fishing village of Touros they were cruising along slowly at 300 feet and sighting a sandy pit they came down. The wheels sank in the soft sand after a short roll damaging the landing gear and the great flight was over.

They had been in the air approximately fifty-one hours and had completed a flight of 4,448.82 miles according to U. S. naval computations basing the figure on the straight airline distance from Rome. Actually they flew 5,024 according to their route through Gibraltar and over the Cape Verde Islands.

The world's distance record, made by Clarence D. Chamberlin and Charles A. Levine in their flight to Eisleben, Germany, from Roosevelt Field, L. I., a year ago, was 3,911 miles, on the straight airline. They too actually flew much further, forced to deviate from their set course by bad weather.

Ferrarin and del Prete have long been classed with Major Mario de Bernardi, Schneider cup winner and world's speed champion, and Commander De Pinedo, pioneer Italian transatlantic flier, as members of a group of pilots that both during and since the war has kept Italy among the leaders in aviation. Major del Prete accompanied De Pinedo on his flight in the Savoia-Marchetti, *Santa Maria,* to Africa and thence across the South Atlantic to Brazil in February, 1927. Their exploit did not end until they had flown back and forth across the forests and mountains of the Americas and again across the Atlantic and home by the Azores.

Ferrarin began his career as a pilot of pursuit ships and Caproni bombers during the war. He was one of the little band of picked pilots who accompanied D'Annunzio on his famous propaganda flight over Vienna near the end of the war. In 1920 he made a 10,000-mile flight from Rome to Tokio intending to continue on across the Pacific. The Italian Air Ministry, however, ordered him home before he could make that attempt. In 1922 he was the winner of the Aviation Grand Cup of Italy in a 1,250 mile race.

At this writing this team of record breakers is held at Port Natal pending repairs to their ship.

WHERE WILL YOU LEARN TO FLY?

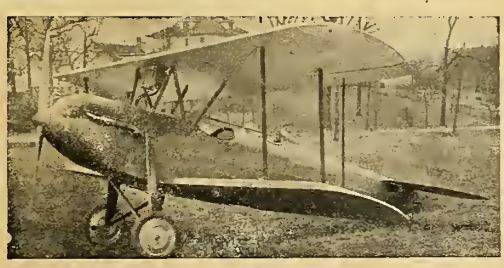
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AIRPLANE DESIGN

AERODYNAMICS

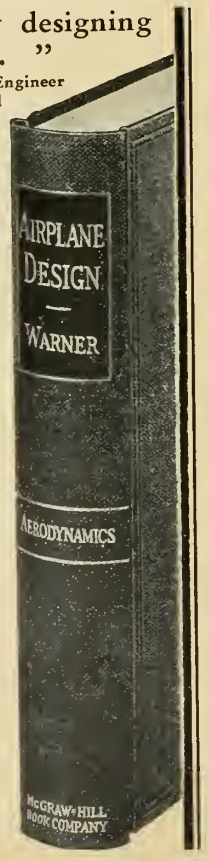
by **EDWARD P. WARNER**

Professor of Aeronautical Engineering, Massachusetts Institute of Technology; Assistant Secretary of the Navy for Aeronautics. 600 pages, 6 x 9, 333 illustrations, $7.50.

THE book synthesizes and interprets the prior art and existing theory and problems bearing upon the functioning of the modern airplane; it lays a solid foundation of fundamentals, presented step-by-step, for those who intend taking up aircraft design, and will also be of immeasurable value to the practicing aeronautical engineer in need of an authoritative summary for reference purposes.

Some of the topics discussed

— types of aircraft;
— fluid resistance;
— calculation of downwash;
— slotted wings;
— wind tunnel tests;
— turning without side slip;
— etc., etc.



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EXAMINATION OF AIRPLANE AND AIRSHIP

(Continued from page 235)

them from competition with the rigid ship in long distance commercial application.

It is roughly estimated that these 158 rigid airships represent a construction cost, including fixed equipment, of not to exceed $75,000,000. This, of course, is exclusive of shops, hangars, etc. It is boldly estimated that the world to date, including the enormous and necessarily wasteful war expenditures and the cost of post-war activities, has spent a total of $3,500,000,000 for both military and commercial airplanes and fixed equipment. An examination of governmental budgets will justify this figure.

This explains in part why the development of lighter-than-air transport is the most neglected engineering art in the realm of aeronautics today. It has not advanced as rapidly as heavier-than-air for the simple reason that approximately for every dollar spent on airships, at least fifty dollars have been spent on airplanes. As Mr. Charles Grey, Editor of *Aeroplane,* London, has aptly put it, "Airships breed like elephants while airplanes breed like rabbits."

Certainly the record of progress of the airship would be entirely different if an equal amount of money had been made available for its development.

Of course, the loss of the British R-38 and the Shenandoah caused many people to become skeptical in their appraisal of the value of lighter-than-air craft, but they should be reminded that every great scientific development has come many times to the cross-roads of doubt where people have stood unequally divided, most of them wanting to turn back and few wanting to go ahead.

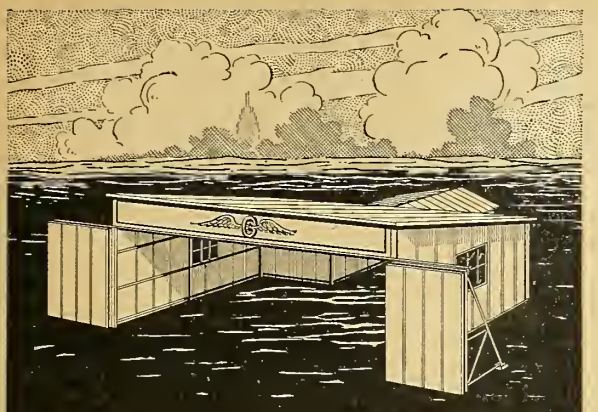
For those who are skeptical about the future of airships, let them be reminded that progress is not measured by present achievement, but is determined by resolution and provision for improvement.

Many people appear to be impatient with the progress of rigid airship development. They should be reminded that the art of design and construction of lighter-than-air craft has not yet come to its maturity. In almost every other line of engineering endeavor, the public seldom learns of the mistakes and the failures. They are thrown into the waste baskets and the public learns only of the successes. But in airship development, and airplane, too, for that matter, it is impossible by the very nature of the product itself to conceal from public view even the most insignificant experiment, and if it is not at once a success, the failure often receives more public attention than does the success which may follow immediately after.

Government orders furnish the only present market with the result that only four rigid airships are under construction in the world today. One Zeppelin of 3,500,000 cubic foot displacement is being built in Germany; two ships of 5,000,000 cubic foot each are under construction in England; and in the United States—with all its surplus of wealth, abundance of labor, available material and engineering skill—only one rigid airship, a metalclad of 200,000 cubic foot displacement, a notable experiment it is true, is under construction. It is not overlooked that the Congress, which has just adjourned, made an initial appropriation of $1,200,000 for commencing the construction of two 6,000,000 cubic foot ships, but to date no contracts have been awarded.

This comparative examination inevitably leads to three conclusions:

(Continued on next page)



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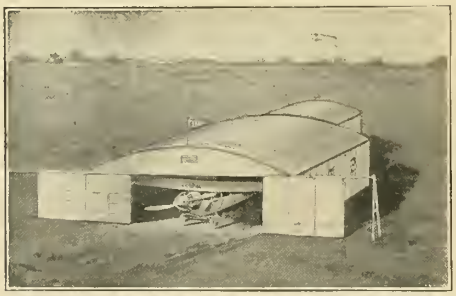
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The airship will eventually bring to each nation a common economic interest in the prosperity and welfare of every other nation in the world. This, indeed, is a worthy mission.

FLYING IN THE NATIONAL AIR TOUR

(*Continued from page* 231)

it left Dayton for the briny Pacific. Will Johnny Wood win with Frank Clewers? Charlie Meyers is next. Riding with him are William Baldwin, of Cincinnati, and Tom Colby of Detroit—Berry Brothers' aircraft finishes, you know.

Eddie Stinson and Mrs. Stinson have three charming gentlemen from Oklahoma in their plane, representing the Tulsa Junior Chamber of Commerce, sponsors of the Stinson entry. They are Lloyd Stone, W. E. Barton and John C. Day. Randy Page has Otto Leisy and A. S. Christiansen of Cleveland with him. They are of the Stewart Aircraft Company, owners of the plane. George Lowers is riding with Braun in the third Stinson. Ray Acre, the Lockheed sales-manager, is in that entry, also Eddie Cooper, mechanic. Pears has William La Violette as running mate in the Fairchild. Marion Stirling and Henry Haute of Detroit are with George Haldeman. Mrs. Omlie, Beard and Atkinson are all going it alone.

Ray Collins has done all the refereeing since the Ford trophy was first put up and has led four fleets of planes through 25 states over routes totaling more than 15,000 miles, with the loss of only one plane by crack up (in 1925) and not a single injury to any pilot or passenger. Up many days at dawn, in order to be off for the next control in time to see that all is in readiness there, he has dropped many a pound and added some gray hairs. He was again aided this year by Captain Gail Breene, of Wright Field, Dayton, O., piloting a Curtiss O-2.

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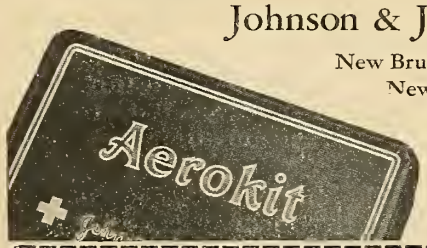
It's the handiest, most ship-shape outfit you ever saw—you can stow it away in almost no space at all. Yet it contains everything needed for the quick treatment of wounds. Bandages, aromatic spirits of ammonia, ointment for burns—sixteen articles in all! And with them, a first aid chart that tells you, graphically and concisely, just what to do and how to do it, even in case of major injuries.

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A REAL RELIABILITY TOUR

(*Continued from page 229*)

er who is also a good sport, came to the rescue. Owning a n plane, he flew it to Dodd field, offered Meyers the loan of the ne, and the transfer was quickly made with the aid of the ght mechanics accompanying the tour. It was a graceful and erous act, and kept Meyers in the race.

The Lady Pilot

favorite of the tour was Mrs. Phoebe F. Omlie, pilot of one he Monocoupes. As the only lady pilot on the tour, she got a or share of the publicity, but no one begrudged it to her. In of a run of ill fortune, she held her little plane in its place on ruise—the first plane of its size to cross the mountains or stand laily grind of such a trip.

t Marfa, making her first high altitude landing, she crashed a el and wing in making a ground loop to avoid a ditch. Jack nson promptly tendered her his Monocoupe and remained with lamaged ship until it could be repaired, after which he caught nd kept the Omlie plane in the tour by checking in at all the ols.

Mrs. Eddie Stinson was Mrs. Omlie's passenger during the Marfa misadventure, and proved her confidence in her friend's piloting by continuing to ride with her. Hence she shared Mrs. Omlie's beach landing, unscheduled, on the way from San Diego to Los Angeles. When accessory trouble compelled Mrs. Omlie to make a hurried landing then, nothing offered but a narrow stretch of sand on the beach of the broad Pacific. A picture that will always remain with the passengers of the following planes was of Mrs. Omlie and Mrs. Stinson, cheerfully waving them on their way as the others circled and glided down toward the beach to offer encouragement or assistance. Probably every pilot did it, but the lady fixed things and took the air without help.

Officials and Helpers

The war department and weather bureau coöperated handsomely with the tour. Captain R. G. Breene and a plane were loaned, Breene piloting the advance plane that carried Referee Ray Collins ahead of the tourists, while he himself was a valuable assistant referee. An army transport piloted by Lieut. Frank B. Tyndall, with Staff Sergeant John S. Carden as mechanic, was also loaned to carry officials and news writers with the tour.

A. G. Andrus, weather forecaster, from Hadley Field, was of much help in gathering weather data for the pilots, who knew daily before taking off what weather lay before them.

The multitudinous details of tour manager were again in the hands of Ray Cooper, who had successfully organized the tour and carried it to an equally successful conclusion.

Harvey Campbell, assistant secretary of the Detroit Board of Commerce, helped handle the details too, and spread the news at the various stops of what Detroit is doing for commercial aviation and why the tour is made and what it stands for.

At San Francisco, half-way point on the cruise, the standing of the various contestants was as follows:

1.	John P. Wood, Waco	13,407
2.	Frank Hawks, trimotor Ford	11,618
3.	Randolph Page, Stinson, Jr.	10,741
4.	Charles Meyers, Waco	10,635
5.	Eddie Stinson, Stinson-Detroiter	10,473
6.	Bruce Braun, Stinson-Detroiter	9,786
7.	William Brock, Bellanca	9,502
8.	Al Henley, Ryan Brougham	9,326
9.	Vance Breese, Ryan Brougham	8,910
10.	Robert Cantwell, Lockheed	8,510
11.	Louis Meister, Buhl Airsedan	8,469
12.	R. W. Pears, Fairchild	7,772
13.	J. N. Kelly, Travel Air	7,572
14.	George Haldeman, Bellanca	7,475
15.	M. V. Aavang, Swallow	6,748
16.	Alger Graham, Buhl Airster	6,555
17.	David P. Levy, Stearman	6,350
18.	Cloyd Clevenger, Eaglerock	5,397
19.	Mrs. Phoebe F. Omlie, Monocoupe	4,908
20.	M. G. Beard, Waco	4,908
21.	E. W. Cleveland, Ryan	3,792
22.	Dan Robertson, Curtiss-Robin	3,341

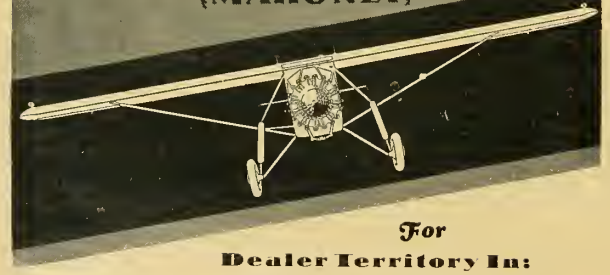
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Employment Dept.

Aviation Institute of U. S. A.

WALTER HINTON, *President*

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(*Continued from preceding page*)

Howard's Eaglerock and Peck's Travel Air had dropped out. Aavang succeeded Jay Sadowsky as Swallow pilot at Wichita, and Lee Schoenhair took Cantwell's place in the cockpit of the Lockheed when Cantwell was called home by illness of his wife.

FLYING THE MOUNTAINS

It was a fine testimonial to the airworthiness of the planes and the reliability of the motors that, with the tour two-thirds completed, the mountains crossed, and the ships headed home on the final stretches of the 6,300-mile cruise, 23 out of the 25 starters were still in the race.

The western stretches yielded some of the real thrills of the tour. Traveling from San Francisco to Portland, for instance, the tourists were fanned by breezes that blew direct from the snow-banks on the slopes of Mount Shasta, visible for 200 miles of the flight. It was only a few miles—or so it looked—off our course.

The Columbia gorge offered a patch across the Cascade range for some of the lower-powered ships, but some, including our trimotor army plane, flew straight across the mountains, emerging from the cloud-banks to find Mt. Tacoma towering a mile above them, close by the course, and a whole range of snow-capped peaks and ridges in line with it.

While the air-mindedness of various cities visited varied in degree before the tour, there can be no doubt that it was augmented by the visit of the tourists. Chambers of Commerce and groups of citizens coöperated in many places in claiming a stop by the planes and entertaining the visitors. In some cities the reception was more or less sponsored by public-spirited individuals or business organizations.

At Indianapolis, for instance, the Marmon Motor Co. and the Prestolite Company were the entertainers. At Los Angeles, Jack Maddux of the Maddux Air Lines and his friends took charge and did a big job. At Froid, the noon stop that broke the hop from Great Falls to Minot, Senator J. W. Schnitzler turned his private field over to the tourists and was a generous host.

A FLYING RANCHER

"I just flew in from my ranch this morning," he told us. "I fly over it in half an hour every morning and then get on the telephone and tell my foremen what to do. It used to take me all day with an automobile." The senator has 8,000 acres in wheat and nobody knows how many acres besides.

Colonel Paul Henderson, Major "Shorty" Schroeder, Major Reed Landis and others of the Aero Commission were in charge of the reception at Chicago.

LANDING FIELDS

Only one or two inadequate landing fields were awaiting the tourists in more than 30 cities, the improvement in airports over the years of former tours being very marked.

The Speedway at Indianapolis and the big Lambert Field at St. Louis need no comment. Springfield, Mo., offered a new municipal field supported by general taxation. Walter Beech's Travel Air field was used at Wichita.

The tour dedicated the new municipal field at Tulsa. Meacham field at Fort Worth was a well-marked municipal field of 175 acres. Waco had one, and San Antonio.

An army field at Marfa was used for a noon stop, and everyone from that part of the world seemed to have driven in to see the planes. Sometimes it seemed as if the small towns and their hinterland were more vividly interested than the big cities.

El Paso is constructing a municipal field. Tucson has one that almost blew away the day we were there. Yuma was sandy and hot and almost spoiled the San Diego reception by driving the boys into cool and comfortable California an hour ahead of schedule.

Mahoney field was used at San Diego, but the San Diegans say, "Just wait till you see our new Lindbergh field." They are about to start raising the tidelands at the end of the bay to a level that will create one of the finest airports in the country there.

Los Angeles welcomed the tourists on Mines Field, a level tract it hopes to make a municipal field. It is pretty far out, but seems the closest tract of size available.

Fresno has a municipal field. So has San Francisco.

Medford, a coast air mail stop, offered the smallest field of the

(*Continued on next page*)

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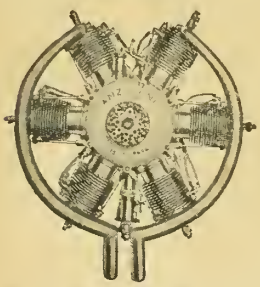
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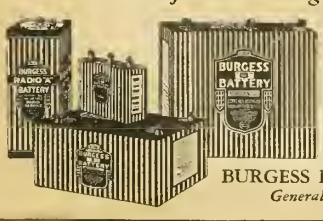
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(Continued from previous page)

lot, and it was rough too. The citizens invited criticism, however, for they have a campaign on for a municipal field, a much better one.

Portland has one of the best of the municipal fields, on Swan island, fairly close to the loop. Tacoma's Speedway makes a big one, Spokane is well provided, Missoula has a municipal field, and Vance Field at Great Falls was typical of a live, air-minded city. Froid has been mentioned.

Minot and the North Dakotans are becoming quite air-minded, Fargo also having a fair city field. The big one at St. Paul, on the level river lowlands, is well known.

Wausaw, Wis., bulges with enthusiasm, and wants an air mayor. It will pay a salary of $1,000 and confer that title on the tour pilot who makes the most flights and landings while on the cruise.

Milwaukee's county airport was the tour's landing place, followed by the municipal field at Chicago, where the lake front, close-to-the-loop airport is still being debated.

Battle Creek has just been given a municipal field by the Kellogg interests. First and last, there was the Ford airport at Dearborn, fitting starting-place and goal of the Fourth National Air Tour.

The Women Organize

Gradually, as last year, our feminine passenger list grew, until it included Mrs. Ray Cooper, Mrs. Eddie Stinson, Mrs. Edward Schlee, Mrs. Bill Brock, Mrs. Frank Hawks, Mrs. Bert Hull, Mrs. Cloyd Clevinger and other charming fares, not forgetting either Mrs. Phoebe F. Omlie, our one and only woman tour pilot.

Mrs. Cooper signed every one of them and initiated them into the Women's Aeronautic Association, recently formed in Detroit, to bring together woman pilots and plane owners and student pilots, wives of owners and pilots, and all women directly interested in promoting aviation.

Mrs. Orra Heald Blackmore of Detroit is president of the association. Mrs. Cooper is its secretary, Mrs. Wm. B. Hall of Detroit is its treasurer, Mrs. James V. Piersol of Detroit is chairman of its publicity committee, Mrs. Clark B. Hyatt, chairman of the membership committee, and among its directors are Miss Olive Dana Mayo, Mrs. Stanley Knauss, and Mrs. Harry Graham.

It proposes to spread among the women the news that flying is not as dangerous as many of them have believed it, and remove some of the pressure which now prevents many husbands from flying. If it isn't a national organization of large membership at an early day the hopes and plans of its founders will have gone awry.

Seeing Peaks from the Skies

As I look back over the Tour I believe the jump from Tacoma to Spokane will stand out as the most memorable. The competing planes in the Tour, in deference to the lower-powered and single-motored contestants, were routed via Vancouver and the Columbia river gorge, but Lieut. Tyndall chose to take the tri-motored Fokker and his load of newspaper men directly over the mountains, whose upper levels were enveloped in clouds on that particular day.

We left the scene of enchantment with regret but, alas, our three faithful motors were taking us out of this upper fairyland at a hundred miles an hour.

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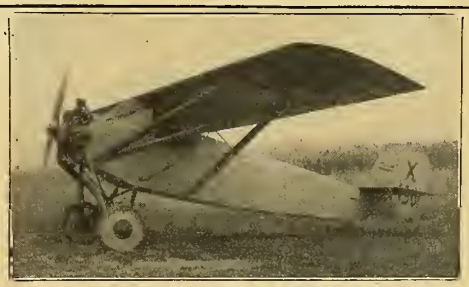
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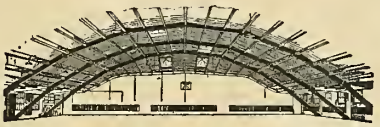
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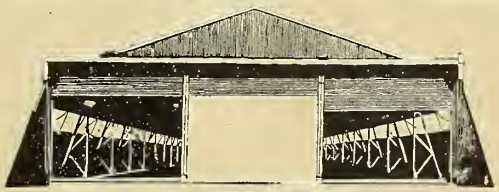
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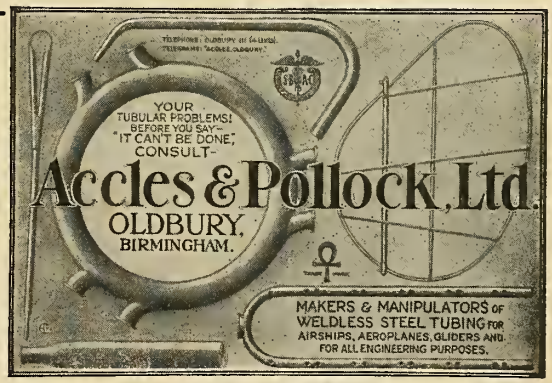
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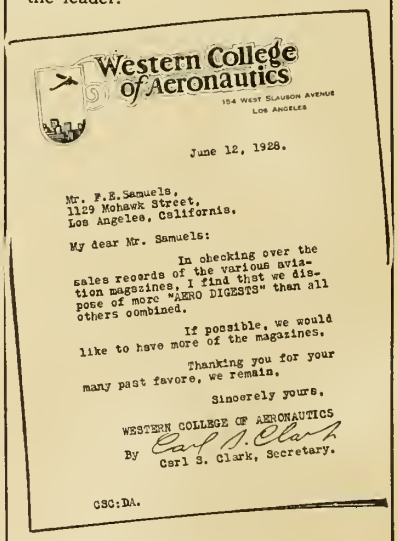
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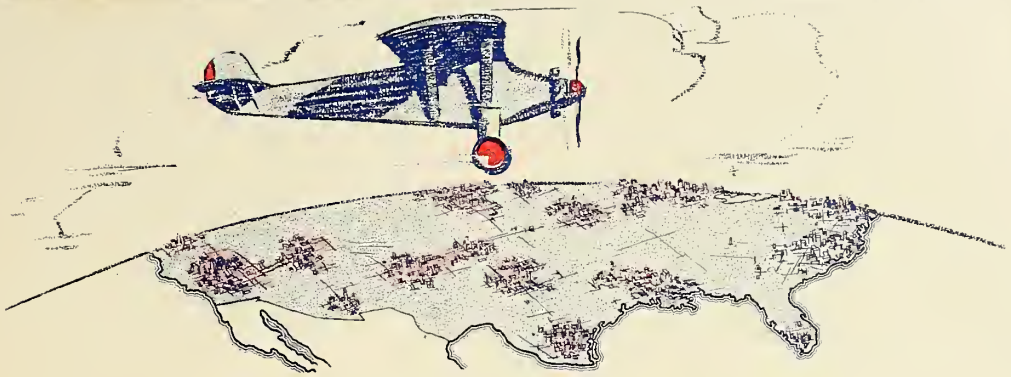
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